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C O N T E N T S

EDITORIAL

THANKS A MILLION

This, the first issue of POIRIERIA since my appointment as Editor, is late. The main reason I must admit being a change in my occupation which has necessitated a considerable injection of time to get the new business established. However, another reason has been the need to acquire sufficient copy to get things off in style. I, and I hope most readers, have appreciated the tremendous amount of material written and prepared by Norman and Noel Gardner, let alone the time spent on cajolery or forms of arm-twisting. There have been few issues to date which have not contained a large proportion of their work. Because of my lack of expertise and my commitments I have not contributed to this issue and this further emphasises the debt we owe to our past Editors.

Whilst looking at the technical matters of preparing the issue, I checked approximate words per line and lines per page numbers and it dawned on me that POIRIERIA to date contains approximately 500,000 words. If a picture is worth a thousand words, the number of plates and diagrams prepared or drawn by Norman must enable us to say "Thanks a Million".

AND CONGRATULATIONS

At a recent - well, between issues of this Journal - meeting of the Section, President Bob Grange offered our congratulations to Dr A.W.B. Powell, the founder and Patron of the Conchology Section, on the award of the CBE for his contribution to marine science. We all realise that the award was well merited and overdue, but are pleased that the powers-that-be are of like persuasion. Congratulations, Baden - we have not seen the citation but assume it reads Conchologist B_____ Extraordinary.

TECHNICAL

The Committee has agreed to provide finance to allow for the costs of this publication and I trust that the improved standard will encourage contributions from a wider range of members and subscribers. This issue is the first in the new format, but please note that the index to earlier volumes will be produced in quarto size, so do not get this bound just yet.

Derek Lamb,
Editor

TAHAROA BEACH

N. Douglas

(19 March 1981)

Our chance to walk along some of this black ironsand beach came on 17 March 1981. Lorna and I, camped near by, left for a walk to the north side of the ironsand works at about 9am. With the tide receding, and a beautiful calm sunny day, the scout along the recent high tide line was a pleasant one. It took us to Paparoa Point, which is about two miles south of Albatross Point - south side of Kawhia Harbour.

These are the shell species that I remember seeing :

Mactra murchisoni: Common, both whole and in halves. No *M. discors*

Spisula aequilateralis: Common, some alive

Paphies subtriangulata subtriangulata: Common, some alive (Northern tuatua)

Paphies ventricosa: (Toheroa) A few here and there all along. Whole, to 3½ inches

Perna canaliculus: (Green mussel) Thousands, fresh in and open, all along

Modiolarca impacta: (Nesting mussel) A few very old halves

Bassina yatei: Two, whole

Dosinia anus: Several, whole

Dosinia subrosea: Two or three, whole

Chione stutchburyi: (Cockle) Two, whole

Tellina gaimardi: One half

Struthiolaria papulosa: Many small adults, dead, and mostly broken

Alcithoe swainsoni: One only, nicely marked, almost perfect, no sign of nodulation

Xenophalium pyrum: Several broken, one perfect

Monoplex: One broken piece

Maoricolpus roseus: Two, very old

Helix aspersa: (Garden snail) Common, washed off sand hills

Some leaf mould and sand scraped out from under a flax bush *(Phormium tenax)*, about half way along, shows much promise of small native land snails. But flax bushes are now scarce and far apart.

After a long period of calm northerly weather the sea was very blue. At lunch time, as we sat a few hundred feet above the sheer rock cliffs at Paparoa Point, the view, both north and south, was enchanting - smothering white foam on the rocks far below, to miles of black sand southward to Marokopa. Perhaps we could see blue hills as far away as Awakino, or Mokau? Mt Egmont was obscured.

Homeward bound along the extreme high tide level revealed the usual Japanese bottles, plastic containers, nylon rope, etc and, of course, *Spirula spirula*, "ram's horn shells". A novelty item was a wooden knife sheath with nylon rope belt attached - quite simple, effective and ingenious - probably Japanese!

Now we are back in our "Hardstop Sprite" as I write this. We have had "tea" and strewn about us there are pieces of rock containing the shell internal casts of the Jurassic geological period. These are from yesterday's rock-hounding. None of the casts (the shelly matter has long gone) appears to be the same species as any I know of living today. We could not find another huge ammonite (see New Zealand Herald, Section I, January 13, 1978) but that strange bivalve, like a coarsely ribbed mussel with queerly offset valves, was common. This is a species of *Inoceramus*. However, they are very hard to retrieve in a whole state from a rock matrix like blue-grey road metal! May you have greater luck or skill when you visit this fascinating coastline.

SHELLING IN THE WHITSUNDAYS

Rae Sneddon

Picture a ten-day family holiday, cruising in a 27 ft yacht under cloudless skies and on calm blue seas around bush-covered islands with numerous small white beaches fringed with coral reefs. The place is the Whitsunday Islands on the Queensland Coast between Mackay and Bowen. The time is the August school holidays. The occasion is the result of an article in a magazine the previous year. And there we finally were, skippering our own chartered yacht in an area where there are few boats, few people, strange birds screeching in the trees and no plastic bags on the tide line.

Dad, Mum and two teenage sons took over the yacht "Liebchen" on August 31 at Shute Harbour and sailed in a warm light wind across to Cid Harbour, Whitsunday Island. We learned about coral very quickly, when we wrapped the chain around a coral head the first time we anchored, but a large son dived and freed us. Then it was all ashore for shelling. And shelling was the order of the day as far as Mum was concerned for the next ten days.

What impressed most was the great variety to be found. After sorting I found I had over 500 different species collected from the area, which is a National Park where you are requested not to take live specimens. So we confined ourselves to beach shells and some hermit crab ones. There was a bait well in the stern of the yacht which we filled with sea water for observing live shells and fish. These included *Haliotis asinina, Trochus niloticus,* several *Cypraea - caurica, cylindrica, annulus, vitellus, carneola, lynx* - and several *Conus - marmoreus, textile, virgo, capitaneus, vitulinus, flavidus* and a small *aulicus.* There were also two kinds of Puffer fish, a Wire-netting cod, a small Epaulette shark, and a Stonefish. Naturally enough, we did not put our bare hands into the tank! Son Grant, while snorkelling, found a live *Melo amphora* which we photographed and put back. Later on Ross found a lovely empty specimen of *Melo umbilicata* sitting on a mudflat, so virtue was rewarded.

We visited so many white coral beaches that in retrospect it is difficult to remember them all, but several really stood out. Turtle Bay, on the southern end of Whitsunday Island, was memorable for Grant's live bailer shell and the dozens of black rays following the tide in across the coral flats. In Cid Harbour we saw our first turtles - head up for a quick look at us, then down again. Dent Island where Bill and Leen Wallace have their Coral Museum, fascinating souvenir shop, and peacocks squawking on the beach. Lindeman Island has a sandspit which yielded a *Lyria deliciosa, Cirsotrema varicosa* and *Phos muriculatus,* and we spotted Sea eagles on a nest with a chick. There also, two dainty swallows roosted the night on our jib sheet and dolphins fished alongside us early in the morning. The Hook Island Underwater Observatory at $4 a head was well worth every cent to view the myriads of fish swimming outside, from the giant Maori wrasse whose head alone filled a while window, to the hundreds of tiny fish of all colours darting in and out of the coral. Butterfly Bay on the northern end of Hook Island was notable for the colour and variety of coral exposed at low tide.

But best of all was Langford Reef. We arrived at half tide and anchored in the horseshoe shown on our chart between two tiny islands. Then as the tide dropped we landed and followed it out. Acres of reef between the two islands became exposed, from sand on one edge to live coral on the other and coral rubble and pools in between. There were all forms of life - fish, long-spined black sea eggs, brightly coloured crabs and a very big variety of shells. These included *Lambis lambis, Malleus malleus, Siliquaria ponderosa, Angaria delphinus, Polinices pyriformis, Strombus erythrinus, S. campbelli, S. labiatus,* cones, cowries and ceriths. We fossicked the reef for three hours and got very sunburnt, lots of goodies - and cross-eyed! It was fantastic. As one entry in the ship's log described it, it was "like walking on the surface of the moon".

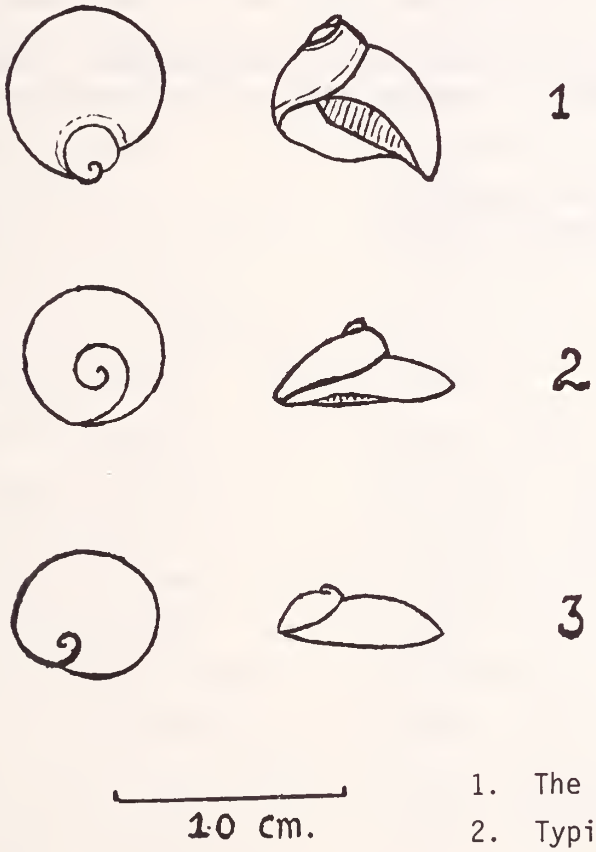
One thing is for sure, we will have to go back there, and hope that when we do, it is still as unspoiled as we found it.

AN UNUSUAL FORM OF ZEGALERUS SP. FROM GREAT EXHIBITION BAY

R.A.Cumber

The genus *Zegalerus* currently involves two recent species - *Zegalerus tenuis* (Gray) which occurs in the North, South, Stewart and Chatham Islands, and is the smaller, less elevated species, and *Zegalerus terraenovae* (Peile) which occurs at the northern tip of the North Island near North Cape and Cape Maria van Diemen. A third species from the Chatham Islands - *Zegalerus crater* Finlay - is comparable with *Z. terraenovae* but not so elevated and with almost straight sides, and is possibly a fossil form with its counterpart in the Nukumaruan of Hawkes Bay. The genus *Sigapatella* Lesson is described as having the apex "somewhat off centre", whereas that of *Zegalerus* is "almost central". (Powell 1979)

On 19 March 1980 beach drift samples were collected at Rarawa Beach, Great Exhibition Bay. These contained many specimens of typical *Z. tenuis* and *Sigapatella novaezelandiae* (Lesson) and in addition a number of an unusual elevated, light brown form with a somewhat sinuous base line and an apex which is even less central than in *S. novaezelandiae*. Some thirty specimens were collected, but in a random sample the *tenui*~~*s*~~/?sp.ratio was 2629/5. The maximum diameter of the specimens in question ranged from 4 - 7 mm.



1. The unusual form described here
2. Typical *Zegalerus tenuis* (Gray)
3. *Sigapatella novaezelandiae* (Lesson)

In the accompanying figure the configuration of comparable sized specimens of *Z. tenuis, S. novaezelandiae,* and the form in question, is shown. The height of the unusual form is immediately evident, as is the a-central position of the apex when the shell is at rest.

My first impression was that this was another example of the diversity of form shown by members of the Calyptraeidae, and that it was an a-typical form of *Z. tenuis* perhaps induced by being sited in a perched position. However, some thirty specimens were eventually sorted from the complete sample, and with the exception of two whitish older bleached examples, all were of a light brown colour. At this stage I considered the possibility that they were the young of *Z. terraenovae* as this is reported from "near North Cape". However, none shows the typical pinkish apex of that species, and the protoconch resembles more the size and form of *Z. tenuis*. There does not appear to be the trace of false umbilicus which appears in many specimens of *Z. terraenovae* despite the generic distinction to the contrary.

Z.tenuis usually shows consideration variation in height and in the positioning of the nucleus, but not the extremes indicated here. Specimens of *Z. tenuis* in the sample reached 15mm in diameter which is twice that of this unusual form. The consistent light brown colour and the absence of the fine, broken, wavy lines which occur in many specimens of *Z. tenuis* from this area are additional features.

This form of *Zegalerus* has not as yet occurred in other northern samples which I have taken. Members will doubtless have additional information on this.

Ref: POWELL, A.W.B., 1979 pp 148-9
New Zealand Mollusca, Collins

A CHECK-LIST OF THE MOLLUSCS OF THE COOK ISLANDS (MOLLUSCA)

J. Coles

This is a check-list of shells collected by ten members of the Conchology Section during a visit to Aitutaki (ten days) and Rarotonga (three days) in September and October 1980.

Shells include live, hermit crab and beach specimens.

A = Aitutaki R = Rarotonga

The assistance of Mr W. Cernohorsky with identification of specimens is acknowledged.

GASTROPODS

Patella flexuosa	(Quoy & Gaimard, 1834)	A
Patelloida saccharina	(Linnaeus, 1758)	A
Trochus niloticus	Linnaeus, 1767	A, R
Trochus maculatus	Linnaeus, 1767	A, R
Stomatia tuberculata	(A. Adams, 1850)	A
Turbo argyrostomus	Linnaeus, 1758	A
Turbo setosus	Gmelin, 1791	A, R
Astraea rhodostoma	(Lamarck, 1822)	A, R
Nerita albicilla	Linnaeus, 1758	R
Nerita plicata	Linnaeus, 1758	A, R
Nerita polita	Linnaeus, 1758	A, R
Neritina oualaniensis	Linnaeus, 1758	A
Littorina coccinea	(Gmelin, 1791)	A
Tectarius grandinatus	(Gmelin, 1791)	A
Vermetus maximum	Sowerby	A
Rissoina ambigus	(Gould, 1849)	A
Planaxis lineatus	(Da Costa, 1776)	A
Cerithium asper	(Linnaeus, 1758)	A, R
Cerithium columna	Sowerby, 1834	A
Cerithium egenum	Gould, 1849	R
Cerithium nodulosum	Bruguiere, 1792	A
Cerithium sinensis	(Gmelin, 1791)	A
Clypeomorus moniliferus	(Kiener, 1841)	A, R
Clypeomorus brevis	(Quoy & Gaimard, 1834)	R
Strombus gibberulus gibbosus	(Roeding, 1798)	R
Strombus mutabilis mutabilis	Swainson, 1821	A

Vanikoro cancellata	(Lamarck, 1822)	A, R
Hipponix conicus	(Schumacher, 1817)	A
Cypraea annulata	(Linnaeus, 1758)	R
Cypraea caputserpentis	(Linnaeus, 1758)	A, R
Cypraea helvola	(Linnaeus, 1758)	A
Cypraea isabella	(Linnaeus, 1758)	A
Cypraea lynx	(Linnaeus, 1758)	A
Cypraea maculifera	Schilder, 1932	A, R
Cypraea mauritiana	(Linnaeus, 1758)	A
Cypraea moneta	(Linnaeus, 1758)	A, R
Cypraea nucleus	(Linnaeus, 1758)	R
Cypraea obvelata	(Lamarck, 1810)	A, R
Cypraea schilderorum	(Iredale, 1939)	A
Cypraea tigris	(Linnaeus, 1758)	A
Pustularis globus	(Linnaeus, 1758)	A
Natica gaulteriana	Recluz, 1844	A
Polinices melanostomus	Gmelin, 1791	A, R
Polinices simiae	(Deshayes in Deshayes & Edwards,1838)	A
Malea pomum	(Linnaeus, 1758)	A
Bursa bufonia	(Gmelin, 1791)	A
Bursa rana	(Linnaeus, 1758)	A
Bursa rosa	Perry, 1811	A
Cymatium gemmatum	(Reeve, 1844)	A
Cymatium muricinum	(Roeding, 1798)	A
Cymatium nicobaricum	(Roeding, 1798)	A
Colubraria nitidula	(Sowerby, 1833)	A
Trophon bírileffi	(Lischke)	A
Thais armigera	(Link, 1807)	A
Thais tuberosa	(Roeding, 1798)	A
Thais hippocastanum	Linnaeus, 1758	A
Drupa clathrata	(Lamarck, 1816)	A
Drupa grossularia	(Roeding, 1798)	A
Drupa morum	Roeding, 1798	A
Drupa ricina	(Linnaeus, 1758)	A
Drupa rubusidaea	(Roeding, 1798)	A

Drupella cornus	(Roeding, 1798)	A
Drupella fenestrata	(Blainville, 1832)	A
Drupella ochrostoma	(Blainville, 1832)	A
Morula biconia	(Blainville, 1832)	A
Morula granulata	(Duclos, 1832)	A
Morula margariticola	(Broderip, 1832)	A
Morula uva	(Roeding, 1798)	A
Nassa certa	(Bruguiere, 1789)	A
Maculotriton serriale	(Deshayes in Laborde & Linant 1834)	A
Maculotriton sculptile	(Reeve, 1844)	A
Maculotriton digitale	(Reeve, 1844)	A
Coralliophila deformis	Lamarck, 1833	A
Coralliophila violacea	(Kiener, 1836)	A
Quoyula madreporarum	(Sowerby, 1832)	A
Pyrene scripta	(Lamarck, 1822)	A
Pyrene punctata	(Bruguiere, 1789)	A
Pyrene turturina	(Lamarck, 1822)	A
Mitrella marquesa	(Gaskoin, 1852)	A
Cantharus fumosus	(Dillwyn, 1817)	A, R
Cantharus undosus	(Linnaeus, 1758)	A, R
Cantharus wagneri	(Anton, 1839)	A
Engina siderea	(Reeve, 1846)	R
Latirus nodatus	(Gmelin, 1791)	A
Peristernia chlorostoma	(Sowerby, 1805)	A
Peristernia fastigium	(Reeve, 1847)	A
Peristernia nassatula	(Lamarck, 1822)	A, R
Nassarius concinnus	(Powys, 1835)	A
Nassarius gaudiosus	(Hinds, 1844)	A
Nassarius graniferus	(Kiener, 1834)	A
Nassarius papillosus	(Linnaeus, 1758)	A
Harpa amouretta	Roeding, 1798	A
Mitra auriculoides	Reeve, 1845	A
Mitra papalis	(Linnaeus, 1758)	R
Mitra procissa	Reeve, 1844	A
Mitra stictica	(Link, 1807)	R

Strigatella litterata	(Lamarck 1811)	A
Strigatella paupercula	(Linnaeus, 1758)	A
Strigatella scutulata	(Gmelin, 1791)	A
Imbricaria conovula	(Quoy & Gaimard, 1833)	A
Pusia pardalis	(Kuester, 1841)	A
Conus aristophanes	Sowerby, 1857	R
Conus chaldeus	(Roeding, 1798)	A
Conus coronatus	Gmelin, 1701	A, R
Conus catus	Hwass, 1792	R
Conus ebraeus	Linnaeus, 1758	A, R
Conus flavidus	Lamarck, 1810	A
Conus frigidus (Juv)	Reeve, 1848	A
Conus lividus	(Hwass in Bruguiere, 1792)	A
Conus miliaris	(Hwass, 1792)	A
Conus musicus	Hwass in Bruguiere, 1792	A
Conus pulicarius	Hwass, 1792	A
Conus rattus	Hwass, 1792	R
Conus sponsalis	Hwass, 1792	A, R
Conus terebra	Born, 1780	A
Conus tulipa	Linnaeus, 1758	A
Terebra affinis	Gray, 1834	R
Terebra crenulata	(Linnaeus, 1758)	A
Terebra maculata	(Linnaeus, 1758)	A
Terebra subulata	(Linnaeus, 1767)	A
Turridrupa cerithina	(Anton, 1838)	A
Philbertia felina	(Hinds, 1843)	A
Daphnella reeveana	(Deshayes, 1863)	A
Philippia radiata	(Roeding, 1798)	A
Janthina janthina	(Linnaeus, 1758)	A
Pyramidella sulcata	(A.Adams, 1855)	A, R
Otopleura mitralis	(A.Adams, 1855)	A
Balcis aciculata	(Pease)	A
Pupa sulcata	(Gmelin, 1791)	A
Amplustrum amplustre	(Linnaeus, 1758)	R
Acteon variegatus	(Bruguiere, 1789)	A
Bulla vernicosa	Gould, 1859	A
Bulla punctulata	A.Adams in Sowerby, 1850	A

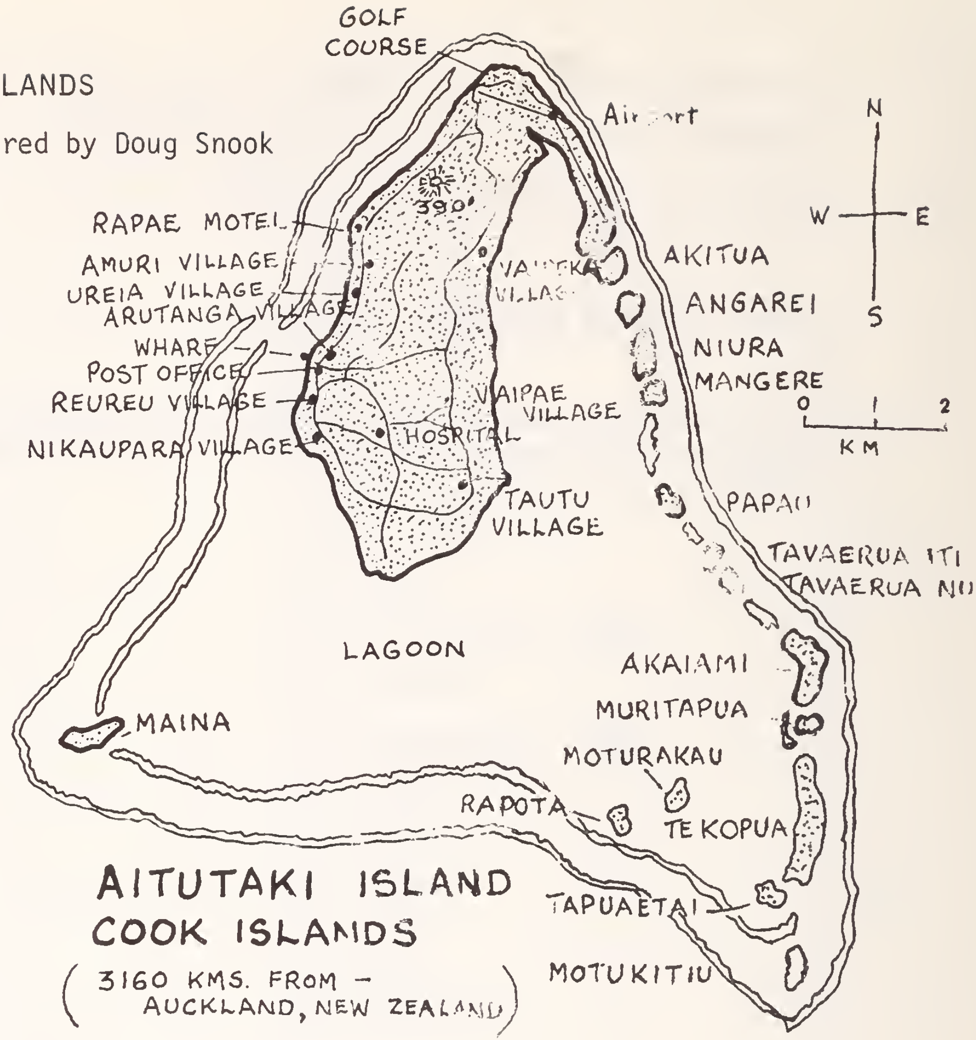
Atys cylindricus	(Heblin, 1779)	A
Siphonaria atra	(Quoy & Gaimard, 1833)	A
Siphonaria normalis	(Gould, 1846)	A
Melampus flavus	(Gmelin, 1791)	A, R

A Check-list of BIVALVIA is to follow.

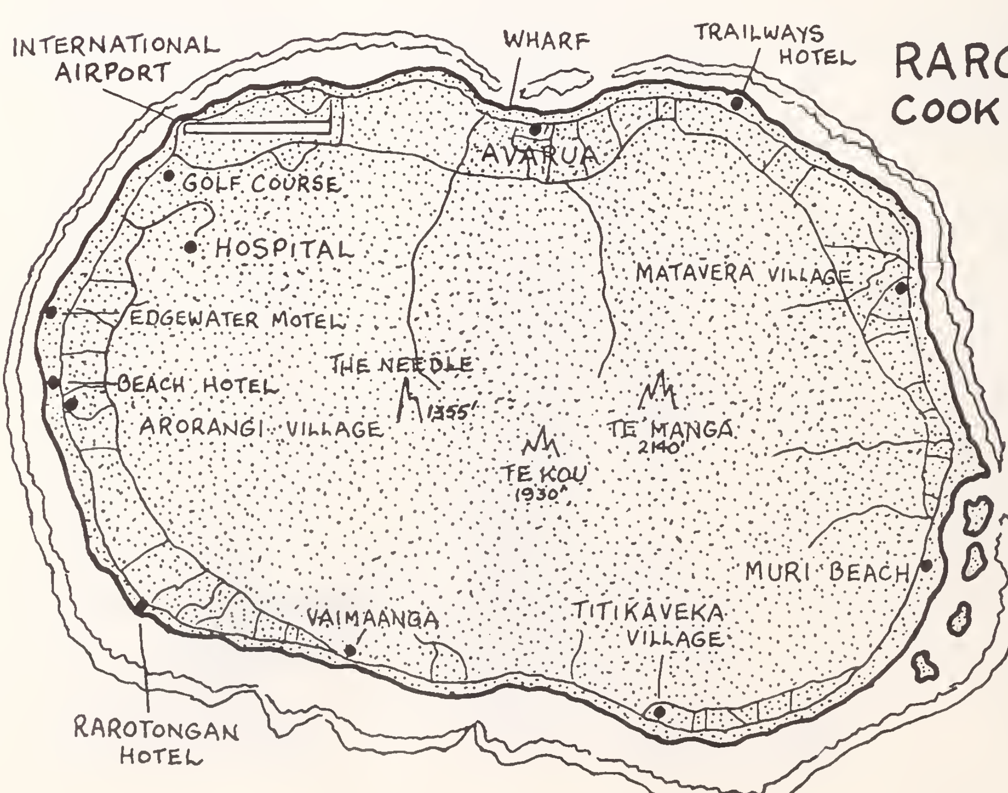
(See also "Sun, Sea-Air and Shelling", by Christine Grange and items of Interest by Noel Gardner in POIRIERIA Vol 10, Part 6. Ed.)

COOK ISLANDS

Maps prepared by Doug Snook



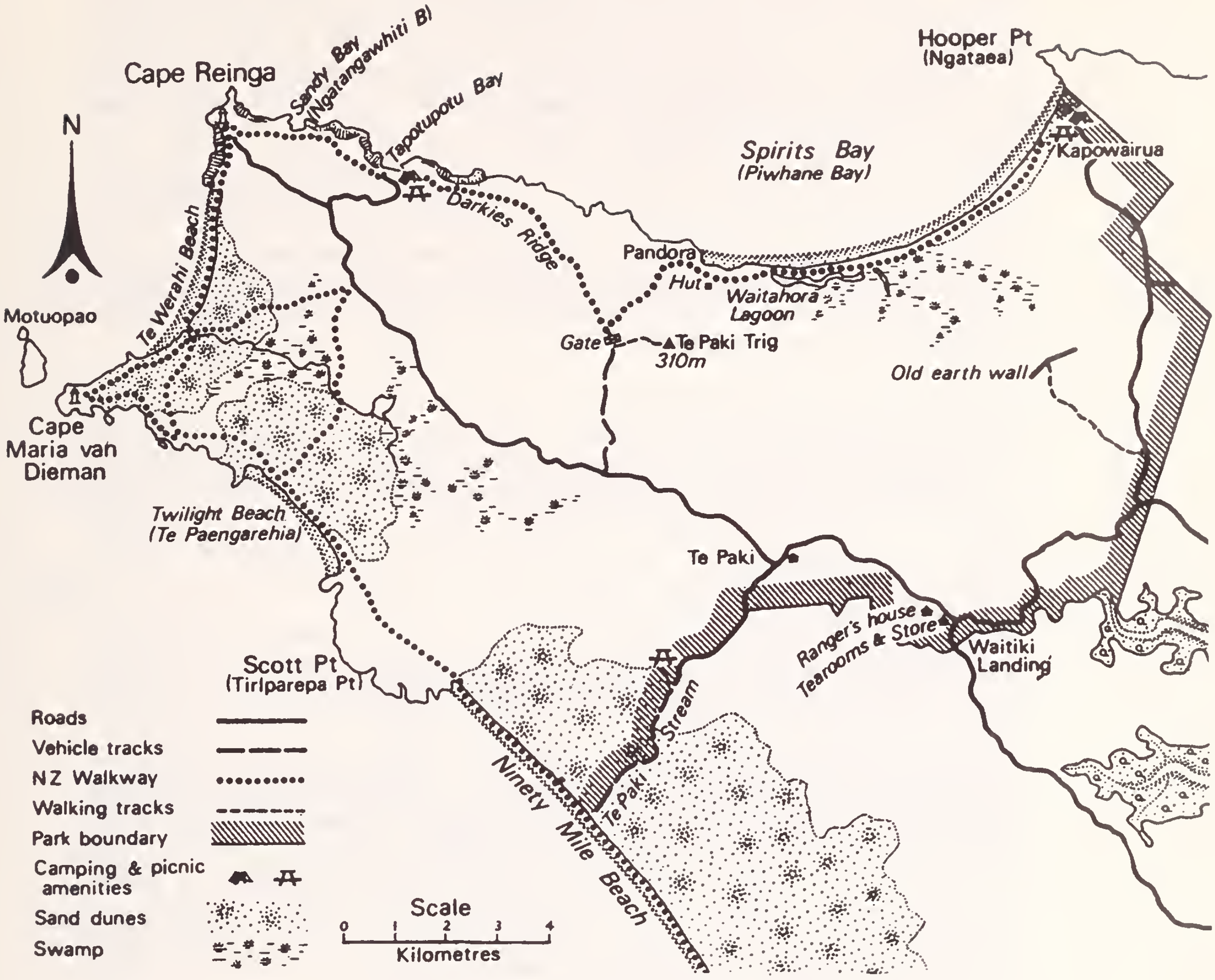
AITUTAKI ISLAND
COOK ISLANDS
(3160 KMS. FROM - AUCKLAND, NEW ZEALAND)



RAROTONGA
COOK ISLANDS

NORTHLAND WALKWAYS

Northland Holiday
Monday, 22 December 1980



FROM CAPE REINGA TO SPIRITS BAY

At least ten-and-a-half hours should be allowed for tramping the track from Cape Reinga to Spirits Bay. The walkway begins at Cape Reinga near the carpark and descends steeply to Sanay Bay, also known as Ngatangawhiti. A steep climb up the other side of the bay on a coastal ridge, keeping close to the cliff, leads to Tapotupotu Bay.

PICNIC SPOT

That section takes two hours and there is a camp site, picnic area and road access at the Bay. From the bay to the Te Paki trig takes about three-and-a-half hours. From the bay trampers must cross a stream near the beach, which is best done at low tide, then take the coastal ridge.

After about an hour's walk the track goes inland over Darkies Ridge, joining the Pandora Track, and reaches a gate at the end of a partly metalled track. From the gate the track runs to the main road and is negotiable by car in good weather. A side track continues to the trig, 310m above sea level, where there are the remains of a wartime radar station and extensive views.

Five hours should be allowed for the portion from the trig to Pandora Beach and Spirits Bay. From the trig trampers should return to the gate, then down a graded track to Pandora Beach. If the tide permits the seaward route should be taken around the rocks to the western end of Spirits Bay, also known as Piwhane Bay, or an alternative route above the rocks. The Spirits Bay campside and Kapowairua lagoon can be reached by continuing along the beach or sandhills.

From Spirits Bay the road leads back to the main road. Strong shoes or boots are recommended for the walk.

Cape Reinga, with the majesty of two oceans meeting, is the starting point for the Cape Reinga to Ninety Mile Beach section of the New Zealand walkways. The walkway starts from the track between the Cape Reinga carpark and the Lighthouse, and follows a marked route along the cliff top to Te Werahi Beach, a walk of about thirty minutes. From there the route follows the beach and crosses a stream to a marker at the foot of a hill at the southern end of the beach, another forty-five minutes.

SIGNPOSTED

A route back to the road is signposted at that point and takes about an hour to cover. Visitors wanting to carry on then follow the markers to the ridge top in about thirty minutes. At that point there is a signpost for a side trip to Cape Maria van Diemen, which takes an hour-and-a-half right round. A well defined, high-level track continues to Twilight Beach, taking another hour.

From there a route back to the road starts up the first stream at the northern end of the beach and trampers can expect to reach the road in about an hour-and-a-half. It takes about an hour to walk to the soutern end of Twilight Beach, where the continuing track is indicated by a marker. Taking care to follow the markers, an old undulating track can be taken over Scott Point.

Descending from Scott Point to Ninety Mile Beach takes about an hour-and-a-half. Walking along the beach to the Te Paki Stream takes about an hour and, following the stream inland, the road can be reached in forty-five minutes.

In all the distance from Cape Reinga to Te Paki Station Road covers 22km and takes seven hours. From the Te Paki Stream, the walkway route follows Ninety Mile Beach, which may be left at Bluff, after 19km, Hukaterea at 51km, Waipapakauri at 69km or Ahipara at 83km.

Visitors intending to cover the beach portions need to make adequate preparation for tramping as there are no huts for overnight stops.

LAND SNAILS IN NORTHERN HAWKES BAY COASTAL FOREST

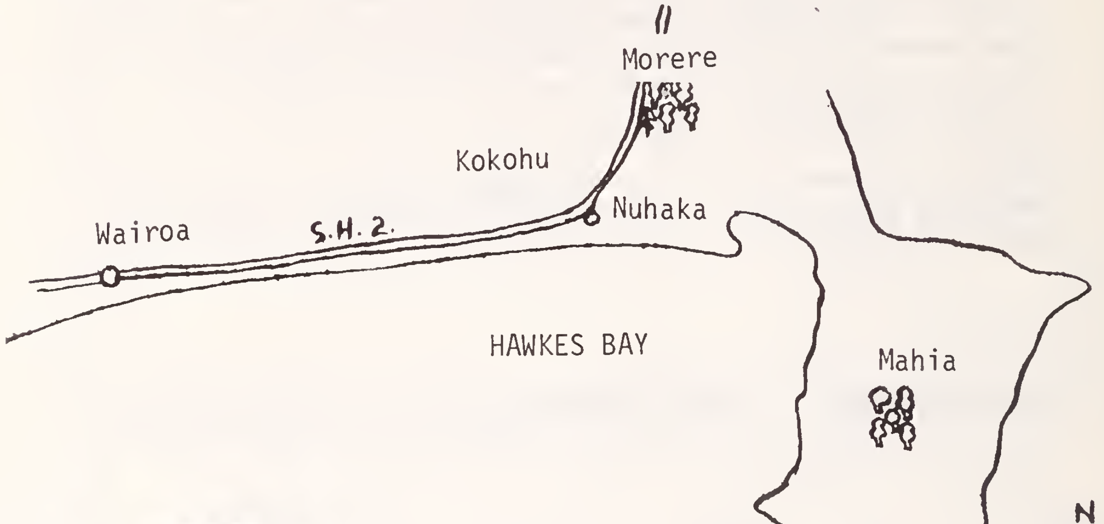
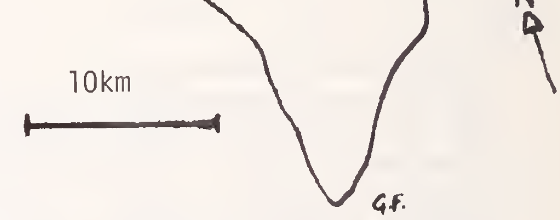
G. Foreman

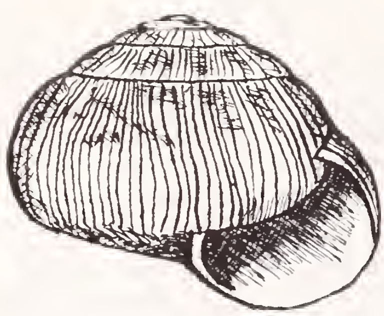
The Northern Hawkes Bay is a hill country farming district with limited suitable habitat remaining for land snails. There are a few fairly large patches of bush but these are eaten out and trampled by cattle, sheep and goats. The only large area of coastal bush where stock is excluded is the Morere Hot Springs Reserve of 360 hectares. The bush cover at Morere is mainly tawa, kohekohe, kohuhu, some emergent podocarps and many large nikau groves. Small land snails are numerous, with the greatest number of species of any area in the district.

In May 1981 the only large piece of bush left on the Mahia Peninsula was gazetted a reserve. This new reserve on the Mahia Peninsula is 340 hectares of typical coastal lowland forest, mainly rewarewa, tawa, kohekohe, nikau and some podocarps. It has been heavily browsed and trampled by animals, but still contains a high number of species, though in small numbers. A most interesting species living in this bush is *Serpho kivi*, possibly in its most southern locality. It is also present in the Morere bush in good numbers, living on the fronds of the nikau palm.

Tornatellinops noveseelandica is present in small numbers at Morere, but does not appear to be present south of here. It appears in small numbers north of Morere, right up to East Cape.

The obvious value of reserve land as snail habitat, through to the odd scraps of cover, is clearly reflected in the number of species surviving in the various areas. Areas looked over about Wairoa and Kokohu are mainly scrubby gullies, sometimes containing a new native trees. Few species are surviving in these areas.



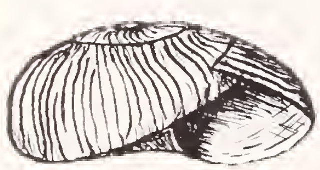
Phenacohelix perplexa

5x7.5mm

2x1.5mm
Laoma ciliata

3x1.5mm

Tornatellinops
novoseelandica



6x3mm
Flammulina chiron

10x8mm
Serpho kivi

Species List from Northern Hawkes Bay Coastal Forest

	MORERE	MAHIA	KOKOHU	WAIROA
Omphalorissa purchasi	X			X
Tornatellinops novoseelandica	X			
Charopa anguicula		X		
Charopa coma	X	X		X
Charopa pilsbryi	X			X
Charopa (Ptychodon) hectori	X			
Charopa (Ptychodon) pseudoleioda	X	X		
Charopa (Fectola) brouni	X			
Charopa (Fectola) buccinella	X	X	X	
Charopa (Fectola) colensoi		X		
Charopa (Geminoropa) microhina		X		
Charopa (Subfectola)caputspinulae	X			
Charopa (Mocella) eta	X			
Phenacharopa novoseelandica	X	X	X	X
Therasiella neozelanica			X	
Therasiella tamora	X			
Suteria ide	X			
Flammulina chiron	X	X	X	
Flammulina perdita		X		X
Therasia decidua		X		X
Thalassohelix zelandiae	X	X	X	
Phenacohelix perplexa	X	X	X	X
Serpho kivi	X	X		
Laoma ciliata	X	X		
Laoma (Phrixgnathus)ariel		X		X
Laoma (Phrixgnathus)glabriusculus	X		X	X
Laoma (Phrixgnathus)phrynia	X			
Paralaoma lateumbilicata	X			
Paralaoma pumila	X	X		X
Paralaoma sericata	X			
Delos coresia	X	X	X	

DEVONPORT COAST WALKS

Margaret Morley

In March as part of the Devonport Festival Professor Morton conducted a series of coastal walks. He produced a well illustrated booklet describing each walk. It included some geological history of the Devonport area, land and marsh biology, zonation of the shore and descriptions of the intertidal fauna. Walks ranged from the soft mud at Ngataringa Bay to the exposed reef at Narrow Neck. Although the series extended for several weeks, we were favoured with fine, sunny weather on every occasion.

NGATARINGA BAY

The first walk caught a few city dwellers unawares. Smart leather shoes were wrecked and long skirts liberally spattered with mud. Jandals were soon carried and gumboots stuck! One short-legged, low-slung terrier charged relentlessly from grey to muddy brown. His mood also deteriorated from eager to downright dejected.

Professor Morton described the four zones :

1. Eroded platform of Waitemata sediment

   We examined the spines on one of the eroding agents, the pill bug *Sphaeroma quoyanum*. The peanut worm *Phascolosoma annulatum* lives in rocky crevices.

2. *Hormosira banksii*

   ... forms a golden zone. Two grazing molluscs live here, *Zeacumantus subcarinatus* and *Turbo smaragdus*.

3. Dead cockle shells with their growth of green algal film form a zone. Grazing on this film are *Notoacmea helmsi* and *Diloma subrostrata*. We sieved the small primitive bivalve *Nucula hartvigiana*.

4. Soft sediment zone

   We did not dig here but noted plenty of evidence of life beneath. I made a mental note to return at a later date with a spade. At this level live *Atrina zelandica* and *Solemya parkinsoni*. By the end of the afternoon we left some very confused crabs that had been removed from their territories. Several had an extended ride in the hood of a jacket!

The highlight of this walk was Professor Morton imitating the running on the spot action of the seagulls to disturb food. This was much appreciated except by those in the immediate vicinity ....

STANLEY BAY

Professor Morton discussed the erosion of the Waitemata cliffs. At the highest level is a film of primitive blue-green algae. In places teeth marks showed where *porare* had been grazing. Other zones are barnacles, oysters, tubeworms and *Horosina banksii*. Sheltered in empty oyster shells were *Fossarima rimata*.

At low tide level Professor Morton wielded a crowbar to break off slabs of sandstone. Here were exposed two rock borers, *Pholadidea spathulata* and *Anchosama similis*. To the dismay of several of the group, Professor Morton devoured these molluscs with great relish, declaring the flavour to be superior to that of oysters! After examining the mantles of several *Anchomasa similis*, he demonstrated the tiny commensual bivalve *Arthritica crassiformis*. *A. similis* can be identified by its accessory dorsal shell plate and permanent gape. It is also larger than *Pholadidea spathulata*. See page 241 THE NEW ZEALAND SEA SHORE, Morton and Miller.

Under the slabs of sandstone at low tide were a wide variety of life. Molluscs included *Buccinulum lineum, Maoricrypta costata* and *Sigapatella novaezelandiae*. The"stacks" of *Maoricryptia costata* were explained. These shells belong to the family Calyptraeidae; all this group are hermaphrodites changing from small males to mature females. The male attaches to a female in order to facilitate fertilisation. Gradually the male changes to a female and a young male eventually settles on her shell. See page 134, Morton and Miller.

I was interested to learn that the eggs of *Austromitra rubiginosa* are laid inside the tests of the sea squirt *Corella* ? The young also develop inside.

NARROW NECK

On this walk we spent time on seaweeds and crabs. The onshore wind restricted low level work on the reef, so I made a second mental note to return at a spring tide. A mollusc not seen previously was *Scutus breviculus*.

SHOAL BAY

A natural shell bank composed of *Chione stutchburyi* and *Mactra ovata* divides the area into two different communities. Inside the shell bank is an area of soft wet nutritive mud. This is ideal for thousands of *Amphibola crenata*. In patches of brackish streams were great numbers of *Potamopyrgus estuarinus*. Higher under logs and in the fringe of marsh plants were *Ophicardelus costellaris*.

Outside the shell bank in addition to *Chione stutchburyi* and *Mactra ovata* were the expected carnivores *Cominella glandiformis* plus dead shells of *Penion sulcatus* and *Alcithoe arabica*.

Professor Morton pointed out the variety of salt marsh plants and explained how they were adapted to the demaning conditions.

There has been talk of reclaiming this shell bank for a road. May the sheer cost of the project deter the authorities from violating the peace and quiet of this delightful area!

TORPEDO BAY and NORTH HEAD

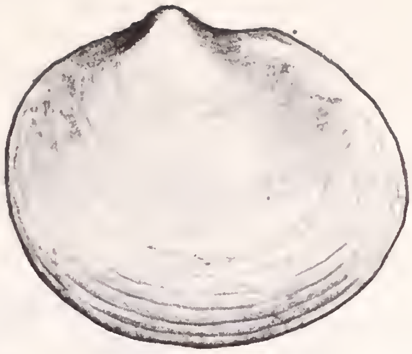
There was some delay in gathering the group for this walk. Considerable time was lost chasing each other round various gun emplacements and in and out of tunnels. However, the usual high level of enthusiasm from Professor Morton more than made up for it. He pointed out all the cliff-dwelling plants and recommended a visit in spring to see them at their best. We looked briefly at zonation and the carnivorous molluscs *Thais orbita, Lepsiella scobina* *Haustrum haustorium*. The wide aperture of *Haustrum* fits easily over the various univalves, eg *Nerita melanotragus* and *Turbo smaragdus* on which it feeds.

CHELTENHAM

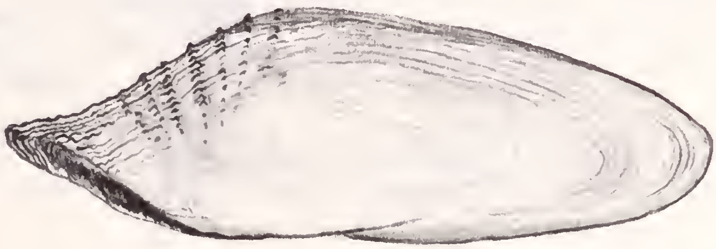
A large group set out armed with spades and garden sieves. Professor Morton identified the varieties of worms. We learned that some have very distinctive smells ... Molluscs were *Dosinia subrosea, Myadora striata, Gari lineolata, Amalda australis* and very large *Tellina liliana*.

BARRYS POINT MANGROVES

The mangrove story was explained and well illustrated by the area near the motorway. We picked our way amongst boulders underneath the motorway. Here were numerous slugs, *Onchidella nigricans* crawling over the surface; they live on diatoms and other organic debris (Miller and Morton, page 83). This damp, shaded spot must be just to their liking. On the far side we discovered an unspoiled salt water meadow. For full details of these walks, see the Devonport Coast Walks Booklet. (Copies are available at the Devonport Library, $1.50). Profits from the Devonport Festival and sale of booklets reduce the debt incurred by fighting the Ngataringa Bay Scheme. The booklet is excellent value and can be used as a guide to each area by individuals. Many thanks to Professor Morton and his helper, Mr Peter Ohms, for their enthusiastic efforts both before and during the series of walks.



Arthritica crassiformis Actual size 1mm



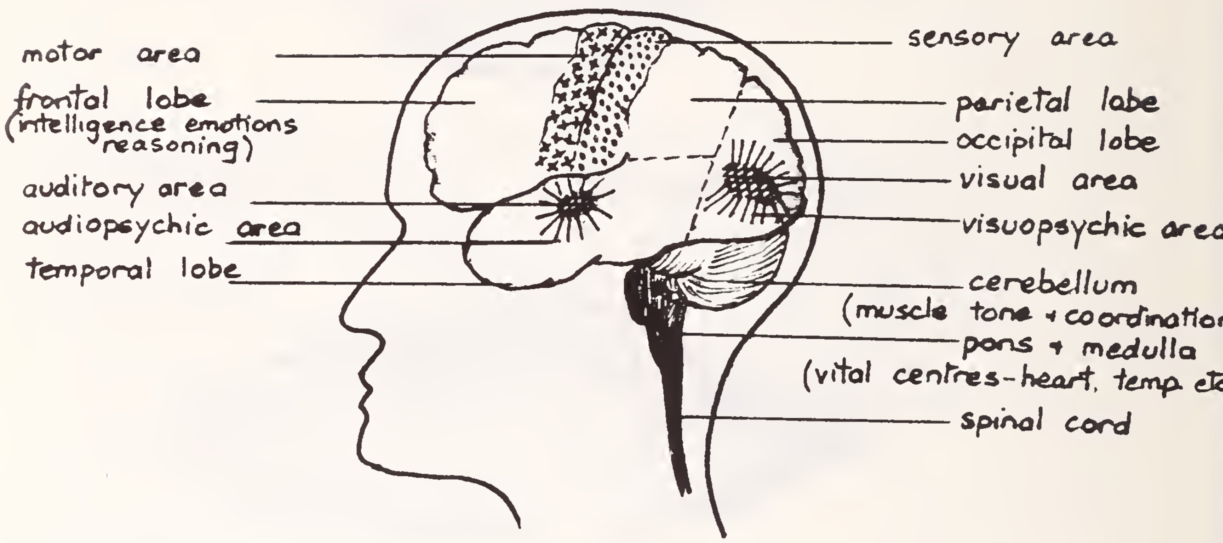
Anchomasa similis Size 60 - 86mm

WHAT'S IN A VISUOPSYCHIC AREA ?

Margaret Morley

Have you ever considered what a marvellous job the eyes and brain do while you are shell collecting? Among a wash-up you suddenly spot an unusual find. It is identified and in the bucket in less than a second. By what mechanism was this done? The light rays from the shell are focused by the lens within the eye on to the retina. The image is then carried by nerve impulses along the optic nerve to the visual area of the brain. This is in the occipital lobe of the cerebrum at the back of the head. Although the image on the retina is upside-down, the brain correctly "sees" the object the right way up.

LATERAL VIEW CEREBRUM-DIAGRAMMATIC.



Now for the vital part, which is probably less well known. Surrounding the visual area of the brain is the visuopsychic area. These two areas have many interconnecting nerve fibres. The function of the visuopsychic area is to identify objects, to correlate visual impressions and to associate them with previous experiences. For example, you immediately recognise that *Nemocardium pulchellum* from amongst all those *Tawera spissa*. This mechanism also explains why you sometimes start to find a species after someone has pointed out the characteristics to you.

When the visuopsychic area has identified the shell as desirable, nerve impulses are sent to various areas of the brain, including the motor area for the arm. From here impulses travel down the spinal cord, connect with nerves in the arm, which then activate the muscles to pick up the shell! Subconsciously other centres adjust muscle tone throughout the body to maintain balance. (Or you would fall in the pool!)

Like a computer, if you programme your brain correctly, it will serve you well. Before a shelling trip, find out what shells are likely to be there and look up illustrations. Also programme your children or less experienced helpmates. Even reminding yourself of possible finds increases your chance of recognising that specimen shell. You need to note the size, shape, colour, patterning, texture and thickness. Any one of these characteristics may be vital, especially if the shell is in water, partly hidden or encrusted. Check any differences between live and dead specimens. For example, colour and size of animal, periostracum. Remember that a brief glance must suffice to distinguish between a brown seaweed bladder and a *Mitra carbonaria*. If a particular species eludes you, take every opportunity of studying it in a collection.

In addition to programming your visuopsychic area, the following ideas may help to give your eyes a clearer view:

1. Use a sieve to wash away fine sand and mud

2. Sieve out hermit shells from sand and inspect on a flat surface on a piece of plastic

3. Take home a bag of shell sand dry, sieve and look over with a lens in a strong light

4. Scratch through the tide line with a stick rather than blocking the view with your hands or feet

5. Concentrate fully on the spot where you are. Don't have half your mind on your favourite site around the corner, or on that sheller following behind!

6. Occasionally look into the distance to rest the muscles controlling the lens

7. A stick or arm laid on the surface of the water blocks wind and wave and reduces distortion.

   Alternatively, a sieve on a broomhandle can be useful. It may save a cold swim!

These ideas are fairly basic; no doubt you experienced shellers can add many more suggestions.

May you "see" all those specimen shells next trip.

POIRIERIA

Conchology Section
Auckland Institute and Museum

Volume 11 Number 2

May 1982

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PRESIDENT'S REPORT

It is again my pleasure to present the Annual Report of the Conchology Section for 1981.

MEMBERSHIP

I regret to say that membership this year has fallen quite considerably, due mainly to the non-payment of subscriptions and the subsequent removal of the Member's name from the Club's lists. The addition of new members has also not been up to the numbers of other years.

MEETINGS

The monthly meetings have again been well attended by local Members and at times we also have had the pleasure of the company of out-of-town visitors. News and material along with slides and photographs have provided plenty of interest for these evenings.

GUEST SPEAKERS

Dr Murray Gregory, Dr Brian Foster and our own Members gave talks on many interesting subjects and trips to both local and overseas locations. A group from the Auckland Regional Authority presented their findings to date on the Upper Waitemata Harbour Survey and promised that they would report at a later date on further data.

ACTIVITIES

A 'weekend away' was held over Easter at Brumby Farm near Russell. 32 Members attended and all reported having had a great time. A catamaran was hired and a day was spent on Moturoa Island. A dredging trip also provided plenty of material [illegible] quite good collecting at times during the year.

LIBRARY

A number of new books have become available this year and are now included and catalogued in the Section's Library, thanks to our Librarian, Mrs Rae Snedden.

PUBLICATIONS

Although only 1 part of *"POIRIERIA"* has been issued during this year - with another due any day - I am sure the new presentation of our magazine makes up for the lack of issues. Material continues to be difficult to obtain and again I request Members to assist our new Editor, Mr Derek Lamb more in this respect. The monthly Newsletter has covered very fully all the activities of the Club and my thanks go to Hamish Spencer and others who have helped in its production.

TRADING TABLE

With the departure to Whangarei of Derrick Crosby, this operation has been taken over by Mrs Jill Adams and Mrs Margaret Morley. Derrick was in charge of the Trading Table for about 10 years and I would like to record the thanks of the Section for his very rewarding efforts.

In closing, I would like to express the Section's sincere thanks to the Museum Authorities and Mr W.O. Cernohorsky for their continuing assistance and use of facilities. My own personal thanks go to all Members of the Executive Committee for their time and help during the year and to all others who have assisted in many other ways.

I thank you.

December 1981

R.C. Grange
PRESIDENT

EDITORIAL

ABOUT THE CLUB

The special issue of POIRIERIA produced to celebrate the fiftieth anniversary of the Conchology Section of the Auckland Institute and Museum was an excellent starter to the weekend get-together held in October 1980. I now have a report on the weekend which I feel should be recorded albeit somewhat tardily. The report naturally mentions the names of those members in two special groups - those who were 'in' at the beginning and those who have made science their vocation. There is, of course, a third group - the rest of us! Mrs Gardner and Mrs Witterick have prepared notes for our records on some of the characters the Club has known over the years and on those people who have done so much to help the Section and its members.

ARTICLES WANTED

This issue is the last (and only the second) for 1981 and Volume 11 will create something of a record by having only two parts. I look forward to being inundated with articles for Volume 12. There is no watertight policy regarding articles, but we should endeavour to give special attention to New Zealand material, followed by the Pacific Basin, especially those areas with little scope for publication and general articles having a bearing on the fauna of this region in particular. I would be pleased to receive some more material along the lines of Mr Spencer's article on the Ostreacea.

Derek Lamb,
Editor

REPORT ON THE CONCHOLOGY SECTION'S CELEBRATION OF ITS 50TH ANNIVERSARY

by Noel Gardner

The 50th Anniversary of the founding of the Club was celebrated by the Conchology Section of the Auckland Institute and Museum during Labour Weekend, 25 - 27 October 1980. About 100 members from all partsof New Zealand attended.

Dr Lindo Ferguson, President of the Museum Council, opened the proceedings on Saturday morning in the supper room of the Museum where members, under the guidance of Mr Doug Snook, had set up a fine exhibition of shells and photographs of Club activities over the years.

Our President, Mr Bob Grange, welcomed everyone on this important occasion of the 50th Anniversary of the Club, started for boys by Dr A.W.B. Powell. Three of the original five boys were present - Sir Charles Fleming, Mr David Baker and Mr Bill Perks.

Dr Powell is as well known overseas as in New Zealand and has done a lot to popularise the interest in shells as a hobby. The Club has also been a school for budding scientists. We are fortunate to be members of a scientific institute with a great deal going on behind the scene; our Club is helping to perform this function for the Museum, eg our Journal, POIRIERIA.

Dr Powell expressed his thanks to Mr Grange for his kind remarks which meant a great deal to him. The five boys who were the first members were very proud of their Club and seldom missed a meeting. Little R. Price would not stand any tomfoolery, and when a doting mother sent along her son to keep him occupied so that she could play bridge, he was put in his place by R. Price who said "Look here, you aren't in school now, you're here to learn something".

With five clubs now in New Zealand - at Whangarei, Tauranga, Wellington, Christchurch and Dunedin, there are some very keen people strategically placed, reporting new arrivals of species, etc and so making further knowledge available.

The clubs provide a training ground for juniors who, later on, often find their way into scientific institutions in other countries as well as in New Zealand. Some who have done so are Sir Charles Fleming - Geological Survey; Dr Dick Dell - National Museum; Prof. John Morton - Auckland University; Dr Winston Ponder and Dr Bill Rudman - Australian Museum, Sydney; John Laxton - Townsville University; Dr Warren Judd - now with Auckland University Medical School; Dr Richard Willan - University of Queensland; Ken Grange - NZ Oceanographic Institute; Andrew Penniket - Lands & Survey; and Dr John Carnahan - DSIR, Canberra. Roger Hutton and Doug Forsyth majored in Biology in their teaching careers, and Phil Warren is with the Zoology Department of Otago University. Elwyn Richardson, who was a very keen young member of the Club, became a well known member of the primary schools teaching profession.

Sir Charles Fleming, an original member, remarked that it was a pleasure to see the Club continue. "Some hobbies may turn out for the benefit of mankind, but most are oriented to satisfy their own curiosity. It is an excitement to find the living shell in its habitat".

Sir Charles said he felt grateful to Dr Powell for starting the Club - as far as he was concerned, it had led to a very satisfying career.

(A copy of Sir Charles Fleming's address follows this article)

Mr Bill Perks, another of the original group of boys, has returned to retire in New Zealand after many years in Australia. He said it was a homecoming to walk into the Museum, but he had got lost in the new part. Reference was made to the direct contribution made by early members on old collecting sites which are no longer there, eg Mt Wellington lava fields - now wall-to-wall industrial buildings. This was the type locality for some species of small land snails. The Orakei bush below the cemetery was the home of *Liarea* and the Eastern Reclamation was another source of specimens for a collection.

In his boyhood days, Suter's Manuel was eleven shillings and it took a long time to save up for it - now, if available, it is $64. Collecting gear was hard to obtain - especially if Dr Powell had got in first - and glass tubing was at a premium.

The Boys Club (Women's Lib!) was a club with Mrs Powell as chaperone, but later it became a young people's club with a value quite independent of whether one was going on with the study as a career or not. The training was invaluable - the comparisons and characteristics of species were good training for the mind. Today, enthusiasts go out shelling with glass-bottomed buckets and colour films to take photographs of live specimens in their own habitat. Many fine illustrations of shells have been printed and years of study have gone into the production of some. For example, a coloured publication of Nudibranchs about to appear is the result of 49 years of study.

Mr Perks spoke of night collecting in Australia when the best specimens of Cones, Cowries and Chitons were to be found. He also made reference to the need for collections in schools and country districts, with an honorary curator - perhaps nominated from this Club.

In conclusion, congratulations were offered to the Club and Mr Perks expressed the hope that now he was retired, he would have the opportunity to come up from Pauanui to attend some of the monthly meetings.

Mrs Lorna Seager spoke of her early efforts at pronouncing latin shell names. On Buffalo Beach, Whitianga, she had watched a very young family picking up shells, and started gathering the different ones herself until, before long, she became fascinated and felt she wanted to find out more about them. Mrs Stocker, who lived in the area, told her that if she wanted help, to "write to Mrs Worthy".

Early members were recalled and some field trips - one came to mind: On a nice day they set off for Tiri Island where there were hundreds of *Alcithoe arabica*. The weather turned nasty later on and Mr MacFarlane was worried about getting them home safely. Another trip was made to Kakamatua, Manukau Harbour, with Dr Powell, Mr A.H. Jones, Mr K. Hipkins and Mr J. Walker - an area of sticky, smelly mud!

(I bet Jock fell in as usual! Ed.)

During the time when Lorna compiled notes of talks, etc, typed and ran them off, the typewriter sometimes played up, but her son came to the rescue and did the job for her so that the newsletter could go out on time.

(Committee members at that time will well remember the wonderful suppers Lorna provided at their meetings. No wonder there was always a full attendance! Ed.)

Mrs Ida Powell (Worthy) remarked that she was thrilled to be there, hearing all the interesting comments and what a pleasure it had been to know Charles Fleming and Baden Powell (she still answered to Mrs Worthy).

Her first help in shell collecting had come from Mrs Sanderson, a northern collector who used to go out collecting with her and encouraged her to make a collection. Mr La Roche was a great help later on, forwarding old letters and material named "A.W.B. Powell 1929" - all housed in tubes. She took it from there that this was the way small specimens should be kept.

In 1934 she came to Patumahoe and Mr Powell suggested she should join the Club, and so she did. At this time, Miss Mavis Holloway was Secretary. Trips were taken to Takapuna and Rangitoto. Though it was 30 miles in to the meetings, she missed only three until 1954. Those were happy years and she could always count on people to accompany her on the way home to the farm - Mrs Powell, Mr and Mrs Matthews, Mrs Seager - and then on alone. Then there were visits to homes to see collections. She remembered Miss May Gillman, who gave her *Tellina spenceri*, and the first shells of *'Siphonalia dilatata'* from Mr La Roche - she still has these 'first shells'. Mrs Powell hoped members still went to other members' homes to view their collections, otherwise these beautiful specimens are never seen. She always enjoys having visitors to see her shells.

Mrs Noel Gardner - has been very involved with the Club. Mention had been made of some spelling mistakes in the original boyhood essays by C.A. Fleming and Bill Perks, printed in our 50th Anniversary publication. These were deliberately left in - after all, not many lads of such tender years are perfect in spelling and the essays were of a very high standard.

Mrs Mary Mouat,who, with her granddaughter, was collecting shells on Cheltenham Beach, showed her finds to 10-year old Noel and invited her to come to see her collection. So another youngster's interest was aroused and this was encouraged by both parents who, through having lived near the beach all their lives, already had some interest in marine life.

First 'shells' were some large clumps of barnacles brought back by her seafarer father from Napier where his ship had gone in to help immediately after the devastating earthquake.

Prof. J.E. Morton had been associated with Dr Powell from his boyhood. He was full of nostalgia and said how lovely it was to be at the reunion.

In 1937 he had stayed at Mon Desir just above Takapuna Beach. In 1936 he had got his copy of Suter's Manual of which he was very proud. At that time three species of *Micrelenchus* lived on the *Eclonia* round the reef, but today they have disappeared from the tidal zone.

He spoke of the *Maoricolpus roseus*, which used to be common in runnels of the papa rock and had now moved out into Rangitoto Channel; and also of missing the New Zealand section of the shell display in the Museum where he could walk down beside the cases, noting the whole phylum. This was useful for working biologists. He noted the absence of the colourful foreign shells now.

(This is to be reinstated in the long term. Ed.)

Prof. Morton's subject "Stockings and Spinnakers" dealt with the mucus feeding of gastropods.

Mr Ken Grange then gave a very interesting account of his work in the Oceanographic Institute in Wellington.

On Saturday evening a dinner was held at the Mon Desir Hotel, Takapuna. During the evening our President, Mr Bob Grange, on behalf of the Section members, presented Dr Powell, our guest of honour, with an album containing letters of appreciation from a number of colleagues with whom he had been associated over the years.

Dr Powell was delighted with the book and was heard to comment that it was the nicest thing he had ever been given.

A number of photographs were taken by Derrick Crosby, including several of Dr Powell with three original members of his boys' club.

On Sunday morning a very enjoyable and successful auction of shells was held. The shells were part of the collection of the late Mr A.H. Jones and the 300 lots were sold in about two hours, although it took another hour to sort out and remove them. Mr Allo made an excellent auctioneer, ably assisted by Mr Gardner who organised the auction and, together with Miss Coles and Mrs Gardner, made up the lots and packaged them. The Gardner effort was further enhanced by Brian Gardner who assisted Messrs Spencer, Crosby and Lamb in handling the finances.

On Sunday afternoon a well attended field trip was held at Shakespear Bay, Whangaparaoa. Numbers of *Struthiolaria papulosa* live on the mudflats and several members were able to see, for the first time, the habitat of the rather uncommon bivalve, *Offadesma angasi* , which lives about 15 - 20 cm down in the sandy mud.

Monday proved to be another fine day and about 40 members went by bus out to Norm and Lorna Douglas' farm at Waiuku. A number of other folk arrived by car, making a company of 100-odd. A most interesting and enjoyable four hours was spent viewing Norm's extensive collections and also admiring Lorna's garden. The bus driver showed considerable skill in manoeuvring his large vehicle through the farm gate without scratching the paint!

A number of photographs of the members were taken - permanent reminders of a lovely day and a memorable weekend.

1. Sir Charles Fleming and Dr A.W. Baden Powell
enjoying one of the personal items in the presentation book

Professor John Morton in full flight with Martin Walker flat out keeping the blackboards clean

3. The Old Boys reunion : Bill Perks, Charles Fleming, Dr Powell and David Baker at the Dinner

4. Some of the members who visited Norm and Lorna Douglas on the Monday

BOYHOOD RECOLLECTIONS OF SHELL COLLECTING IN THE NINETEEN TWENTIES

by C.A. Fleming

When I was a small boy, my family generally spent the summer months at Takapuna in a house on Hurstmere Road with a beach frontage. We bathed and learned to swim, dug and built sandcastles, ate pipi, fished for piper and pakiti, and explored "round the rocks" of basalt towards Milford, less often under the Waitemata sandstone cliffs towards Cheltenham where we knew the residual stacks on the rock platform as the King and Queen, the names used by Bruce Mason in his "End of the Golden Weather". The habit of bringing fish, crabs, shrimps and shellfish home in a tin bucket of sea water began early (say 1921), and within a year or two I was encouraged to start a shell collection, using some small wooden cabinets of drawers dating from Victorian times, and helped by my mother printing labels in a neat hand. (Shells did not smell as badly as dead fish or crabs!)

My father's books included a copy of a popular edition of "Cuvier's Animal Kingdom" (that had been my grandfather's) with pictures of *Conus* in colour and other shells as engravings. At this date, Moss's "The Beautiful Shells of New Zealand" (1908) was out of print, and (short of buying Suter) we had no real guide to the names of New Zealand shells until Dr C. R. Bucknill's book "Sea Shells of New Zealand" was published in 1924, with illustrations mostly by A.W.B. Powell. I received a copy of Bucknill for my ninth birthday on September 9, 1925 and labelling proceeded apace. I can see in my mind's eye my mother's neat lettering "*Barnea similis*" in blue fountain pen ink on a plain visiting card, neatly underlined in red ink. We made occasional visits to the old Auckland Museum in Princes Street, but found this of little help. Nor, indeed, do I recall much encouragement from school until a later date.

Some forgotten contact of my parents put me in touch with Mr Alfred Suter, son of the writer of the "Manual of New Zealand Mollusca" (who died in 1918). Alfred Suter, by then a middle-aged man, had collected land shells for his father and enjoyed taking me out as a companion to Titirangi or the Waitakere Ranges, to search for tiny snails in the forest litter. Our dentist was Dr Holbrook A. Chatfield, a sportsman and naturalist who took a deep interest in the Auckland Institute. He gave me the duplicates in his collection of "Transactions of the NZ Institute", early volumes with romantic reading of Colenso, Travers, Hutton and others, who whetted my taste for many different topics. I recall he gave me a *Calliostoma selectum* and an *Alcithoe depressa* from Ninety Mile Beach, rare species for an Aucklander who could not wander far from base.

In one of the school holidays, probably May, my parents drove me to Tauranga for a few days, partly because Dr Bucknill's book recorded so many species from "Mount Maunganui" and partly to meet the old man himself. This must have been only a year or two before his death.

Naturally we could not collect a fraction of the species he had obtained in many years' residence at Mt Maunganui, but the experience was memorable and Dr Bucknill urged me to get to know Baden Powell. I was too shy, but I already knew the antique shop Mr Powell's parents kept at the top of Shortland Street, and I occasionally bought a shell there when I had been given money as a present. Bucknill also told me I should supplement his book by using Suter's Manual, which I was given for Christmas, 1927.

My parents were friendly with Charles R. Laws (whose father, in fact, had christened me). C.R. Laws returned from war service to study for his degree part time at Auckland University College, while training and working as a teacher, living at the bottom of Minnehaha Avenue, Takapuna. He had become interested in shells from his Geology classes and collected both living and fossil molluscs. When his wife had twins, my mother gave Mrs Laws a chance to recuperate by looking after the babies for some weeks, and on our next stay at Takapuna I was invited to call and see the Laws shell collection. This neatly curated collection had a tremendous influence in inspiring me to a more scientific approach to my collection and field work, so that I read everything I could get on mollusca and began to preserve Nudibranches (etc) in methylated spirits (then available without coloured dye). I think it was at this stage (but it may have been later) that my father (who had been a member of the Auckland Institute for years) asked for his entitlement of the annual Transactions volumes, so that I was able to read (but not necessarily to digest) the papers by Finlay, Marwick, Bucknill's Chiton papers and a paper by Farnie (1919) on the anatomy of *Amphibola crenata* that had led me to dissect not only that species but also the large *Haminoea* we used to collect at Waikowhai on Manukau Harbour. The contact with Charles Laws (who became Dr C.R. Laws, a lecturer in Geology at Auckland University) also made me familiar with fossil shells.

I used to read the nature columns that appeared in the Saturday Supplements to the "NZ Herald" and "Auckland Star", and for some time I corresponded with Mr A. T. Pycroft who wrote for the latter paper, but I signed my name as 'Riroriro'. His son Leigh went to school with me and I met "Pyc" when I visited his home, a link with someone who had corresponded with Sir Walter Buller and who seemed to know everyone who was active in natural history studies. By this time (1929) the Auckland War Memorial Museum had opened and I spent many Sunday afternoons comparing specimens from my collection with Powell's new display cabinets.

I began secondary schooling at King's College in 1930, where I was lucky enough to have the late Mr William Delph as a teacher in my first term. At that time he was working with Gilbert Archey on a description of Piranui Pa, near Arapuni. He picked (or had been told) my interest in natural history. When Mr Court offered an excursion on his launch "Ruamana" on March 15, 1930, "Bill" Delph (as we called him behind his back) asked me (alone of my classmates) to join more senior pupils on a Field Club trip to the fossil bed near Oneroa, Waiheke, on which Mr Powell and Professor J.A. Bartrum

had published the first paper a year before. Powell and Pycroft came along as guests and leaders. After we came ashore, most of the party walked off to the fossil bed, and probably I would have done likewise if I had known where they were going. But I stayed at the water's edge collecting shells in a salt bag and a Mason jar I'd brought with me.

When the party returned, Mr Delph asked me what I'd been doing and (when I told him) he asked me to show what I'd got. I told him I'd got a black Nudibranch I hadn't seen before, "but I'll find its name when I get home, in Suter's Manual". Immediately a big man in shorts, standing in the shallow water near the dinghy, spun round on his heel to see this odd child who used Suter's Manual. When he saw the black Dorid, however, he had to admit that he too had never seen one like it. So he spent the next ten minutes persuading me that it would be best if I let him take it for the Museum collections and make a watercolour sketch before it died. It proved to be the second New Zealand record of *Dendrodoris nigra* (as it is now called) but, far more important, it led me to fifty years of friendship and inspiration from Baden Powell.

Later in the same year, Mr Powell (as he was then) founded the Auckland Museum Conchology Club, now the Conchology Section of the Auckland Institute, which put several young Auckland shell collectors in touch with each other and gave us the chance to learn a great deal more about the Mollusca than we could ever do on our own. In addition to weekly meetings at the Museum on Wednesday afternoons after school, we had periodic weekend field excursions, among which I remember most vividly those to Rangitoto and Tiritiri Matangi Islands and to Whatipu, Manukau Heads. But the nineteen thirties were so crammed with excursions, expeditions and experiences that they deserve a separate article some other time.

As I did not keep a regular diary, and have written these notes from memory, a few of the events mentioned may in fact have taken place after, not before, 1930.

FURTHER REMINISCENCES

by Noel Gardner

Field days and weekend trips have always been highlights of Club activities and it has been interesting to observe the changes in different areas.

Cheltenham Beach, Devonport used to support a large colony of well coloured *Alcithoe arabica*. *Maurea pellucida* would, at times, be found on the rocks and even out on the low tidal sandflats. Large numbers of *Amalda australis* lived near low tide and many bivalves lay hidden in the sandy mud.

At Narrow Neck, *Chlamys zelandica, Cookia* and *Buccinulum* species were a common feature, and *Micrelenchus* abounded on the *Eclonia.* Takapuna Reef was full of life with *Chiton, Chlamys, Buccinulum, Marginella pygmea* and *cairoma* and *Rochefortula* always to be seen.

Castor Bay reef was a particularly good spot for many Nudibranchs as well as Molluscs. Oil spillages during the War were mainly responsible for the disappearance of many species. A few survive and a few more have returned in small numbers.

On Rangitoto the high tidal fauna persists, but many molluscs seem to have practically disappeared from the littoral zone.

A few highlights in particular come to mind:
A most interesting field trip with Prof. John Morton to Cheltenham Beach,one rather showery afternoon, caused some amusement. A keen group of our Club members were introduced to some of the lesser known marine fauna of the sandflats. Spades were used to dig and examine live *Tellina liliana, Myadora striata*, various curious worms, crustacea and also a brittle star among others. As the tide began to come in and another shower of rain came over, one or two people made for the shore; the rest stayed listening intently to Prof. Morton's highly graphic description of the habits of the marine community, while the tide crept up around their legs. Strollers walking along the beach cast some very puzzled glances at that group standing away out in the middle of the bay - in about a foot of water!

Weekend field trips have always proved fun and the times spent at Sunny Bay, Kawau Island were amongst the best. A small rowboat was used to drag a dredge just off the wharf and several choice species of shells were brought ashore to be put into a dish of sea water and examined. Quantities of sand dredgings were put into an old washing machine bowl and bagged up also.

Beehive Island will be remembered for its colony of *Charonia.* Joan Willan and Noel Gardner waded around among the seaweed at low tide and amused themselves by picking up one *Charonia* after another - and then throwing them back, hopefully to breed and produce better shells. Of the 23 found, all had quite badly eroded spires, but Vera Walker, who had wandered off round the island, came back with a beauty which was much admired.

While collecting in the area, someone asked "How do you find them?" "You do it this way", answered Joan Coles and, demonstrating, she put her hand under a ledge. To everyone's astonishment - not least her own - she brought out a beautiful red specimen of *Charonia capax rubicunda.* The rest of the company could not repeat that trick!

Jock Walker was always full of fun and had a great affinity for water - in fact, on our field trips, it was not a case of "if" Jock fell in, but "when". He even managed to drop his glasses into the water at Sunny Bay, and it took some time and effort on the part of Joan Coles and Joan Willan to retrieve them. A photo taken at the time shows them leaning well over the back of the dinghy, staring intently into the clear water!

Bob Grange will remember that on one trip up north he decided to go fishing and found, when opening his bait, that he had picked up a packet of sausages! It was on that trip that Bob, while walking round a narrow path several feet above the shore, suddenly - to the amazement and consternation of the person following - disappeared. He had stepped into a grass-covered hole, but luckily was quite unhurt.

It is difficult to remember many of the shells collected during Club field trips, but the long walks on our beaches and the rambles round the headlands and reefs in fresh air with good company will often come to mind.

OSTREACEA IN NEW ZEALAND

by Hamish Spencer

Our New Zealand oyster species have had a rather confused taxonomic history. Powell (1979) accepts five species, although two of them - *Ostrea charlottae* and *O. heffordi* - with reservations. Two recent papers have clarified the situation with, however, the unfortunate side-effect of name changes.

In the first of these, Chanley & Dinamani (1980) look at the larvae of our species, plus one from Chile, *O. chilensis*. They noted many differences in size and shape between the larvae of *O. lutaria* and *O. chilensis* on one hand and other oyster species, eg *Crassostrea gigas* and *Saccostrea glomerata*, on the other. Also, *O. lutaria* produces only a few thousand eggs and larvae, while other species produce millions. This has led them to suggest that these two species represent a primitive element of the *Ostreacea* and have thus accorded them a new genus, *Tiostrea*. They believe that a separate family, the *Tiostreidae*, may even be warranted in view of this antiquity.

The second of the papers, Dinamani (1981), contains a description of a new species, a true *Ostrea* this time, *O. auporia* from northern New Zealand. He also discusses the "species" *O. charlottae, O. heffordi* and *O. fococarens* - the latter is the subject of an appendix by Dr Beu - and it is concluded that they are all almost certainly synonyms of *T. lutaria*.

This leaves us with four recognised species as follows:

Saccostrea glomerata (Gould, 1850) - our familiar Auckland rock oyster, forming a zone below the barnacles in the midlittoral zone (see Morton & Miller, 1968), in sheltered waters around the northern coast from Kawhia on the west to East Cape, and also the Chatham Islands. This has a violet right or upper valve, with a dark serrated border, lacking in the next species. Chanley & Dinamani (1980) accept for the time being the validity of Stenzel's (1971) separation of *Saccostrea* and *Crassostrea*.

Crassostrea gigas (Thunberg, 1793) - The self-introduced Pacific or Japanese rock oyster occurs slightly lower on the shore and grows to a much larger size than the above species. It has a white interior to the shell, which is longer than wide and is found, at present, on the East coast from the Bay of Islands to Ohiwa.

Ostrea auporia Dinamani, 1981 - This is found still lower on the shore, around the lower spring tide level, adhering on more horizontal surfaces than *S. glomerata* and also under boulders. It is rather smaller than *S. glomerata*, about 40mm in height, with a generally rounded outline. The upper valve is a weathered olive-grey or chalky colour, occasionally with a thin purple border, while the interior is greenish with dark muscle scars. Its known distribution is on the West coast from Raglan and Manukau Harbours, and on the East from the Hauraki Gulf northwards.

Tiostrea lutaria (Hutton, 1873) - (= *angasi* non Sowerby, *sinuata* non Lamarck and *charlottae, heffordi* and *fococarens* (Finlay). The Bluff oyster is a rather variable species, occurring on bottom debris in deep water, low tide rocks, as well as algal holdfasts. It is the only species occurring throughout New Zealand (including the Chatham Islands) and is commercially harvested in Foveaux Strait. The shell grows to about 90mm, is a whitish colour externally, covered in a light brown periostracum, the interior being greenish. The shell is distinguished from specimens of *O. auporia* growing in similar situations by size, shape - *T. lutaria* is a more regular subtrigonal shape (see Powell's (1979) illustration) - and sculpture - *T. lutaria* has many layers of shell visible on the upper lip, while in *O. auporia* these are not clear.

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AN EXTENSIVE WASH-UP IN GREAT EXHIBITION BAY - MAY 1981

by R.A. Cumber

The stormy northern weather of 4 - 8 May 1981 caused a notable wash-up in Great Exhibition Bay. The height of the disturbance according to a local person was the "middle of the first week of the shooting season". Daphne and I camped at Rarawa Beach from 16 to 20 May and visited the area each day. During this time only seaweed collectors who came from the North by Land Rover were in the area. However, there had been shell collectors at the site at least on the two days prior to our arrival.

Rarawa Beach, as is often the case, was rather bare and Paxton Point with its masses of older tumbled shell appeared little changed. Further up Great Exhibition Bay, however, a wash-up approximately one mile North of the stream was plainly visible as we rounded the Point, and left us in no doubt as to where we were heading.

Well before we reached the scene it was obvious that most of the black-backed gulls in the district had congregated there - the sand near the river mouth was noticeably stained, and the fossicking flock was plainly visible in the distance. At the site seaweed was thrown up along some 200 metres of the beach. It occupied a zone more than 30 metres wide, and at one point formed a solid mass to a depth of a metre and a half. On its Southern margin much lay buried in the sand.

The very rough weather apparently had coincided with lower than average tides, causing very severe damage to beds of seaweed and shellfish. There had also been high mortality amongst the hermit crabs - many still occupied deeper-buried shells. In the calm weather following the storm, the tides were relatively small. This aided collection considerably, for they did little more than re-sort the materials which had been thrown up during the main wash-up.

The dominant mollusc present was *Atrina zelandica* (Gray). These for the most part were 10-15cm in length. They occupied a zone some five metres in width from a point just below the storm high mark. In places they were more than 20cm deep and crunched loudly as one moved about. They numbered many hundreds of thousands - some beds must have been decimated.

Each tide gnawed at the lower margins of the seaweed and exposed more materials, but many of our best finds were revealed when we moved the weed higher up the beach. This rather strenuous procedure was carefully watched by our feathered friends, who soon moved back in when we moved out.

Species quite commonly present included *Maurea selecta* (Dillwyn); *Umbonium zelandicum* (H. & J.); *Struthiolaria vermis vermis* (Martyn); *Struthiolaria papulosa* (Martyn); *Xymene ambiguus* (Philippi); *Austrofusus glans* (Roding) and broken *Tonna* spp. Amongst those which we found of particular interest were *Maurea pellucida spirata* (Oliver); *Clanculus peccatus* (Finlay); *Xenophora neozelanica* Suter; *Trivia merces* (Iredale); *Xenophalium thomsoni* (Brazier); *Turritriton tabulatus exarata* (Reeve); *Ranella olearium* (L.); *Bursa bubo lissostoma* E.A. Smith; *Columbarium spiralis* (A. Adams); *Poirieria zelandica* (Q. & G.); *Austrofusus chathamensis* Finlay; *Penion dilatatus dilatatus* (Q. & G.); *Nassarius aoteanus* Finlay; *Nassarius spiratus* (A. Adams); *Fusinus genticus* (Iredale); and *Bullina* sp.

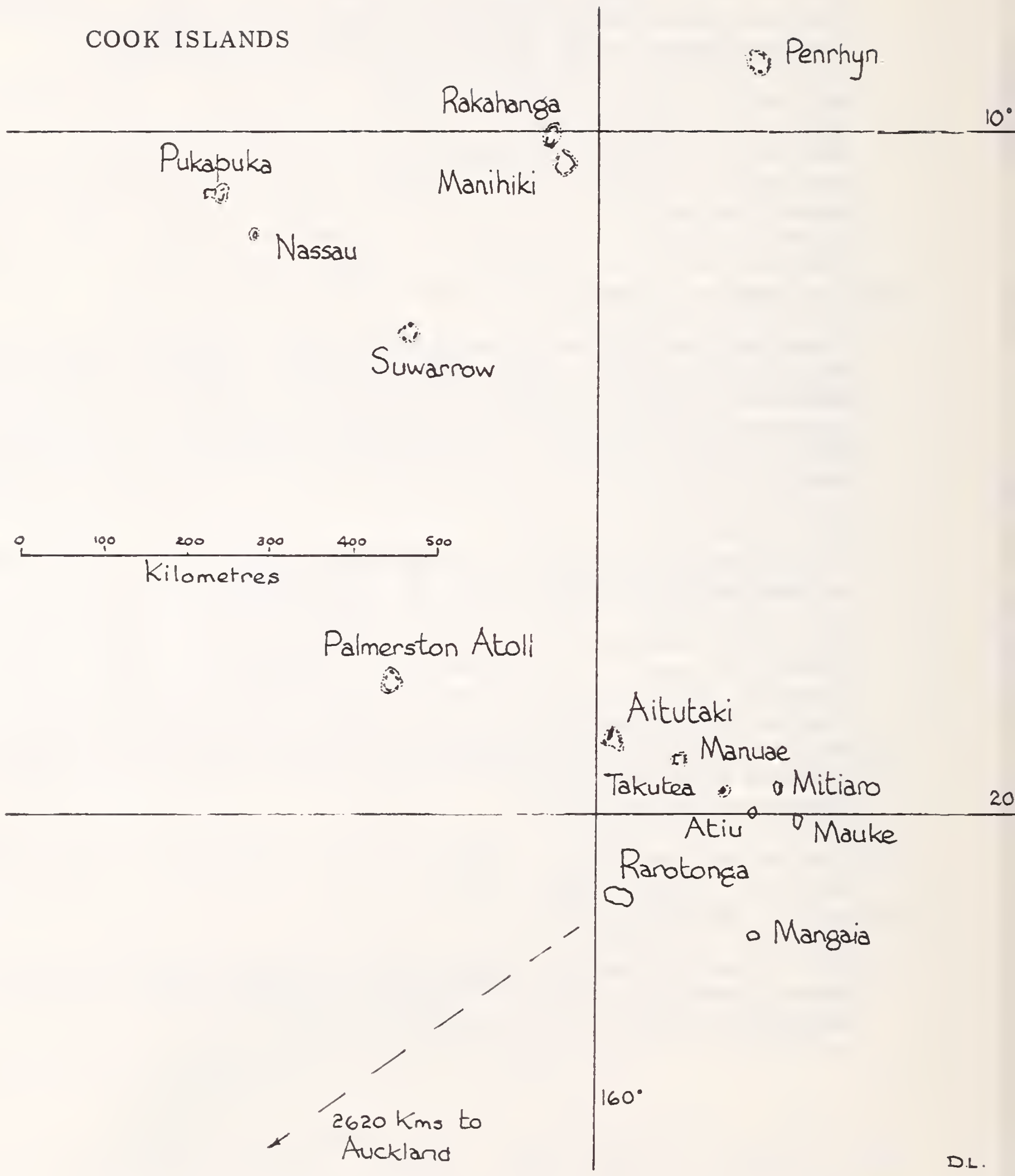
A most variable series of *Austrofusus glans*, including some very tall specimens, was taken. Such collections are extremely interesting, for one is able to gain some insight into variation in the one locality. And yet the scene may not be so local as one suspects at first. Active currents, the proximity of shallow and deep habitats, movement by hermit crabs, trawling operations, etc may bring together specimens from quite distant sites.

A fully grown specimen of *Struthiolaria papulosa*, with whorls which had become separated from an early age, was taken.

The warmer weather did little for the atmosphere at the collection site. Whenever we moved to the windward for sustenance, it was a signal for the gulls to return to see what else we had unearthed for them. Despite the decomposition, no flies were seen at the wash-up site - due perhaps to the wind direction - or nature's better judgement. We noted also that near the river mouth the oyster-catchers were digging out young toheroa.

For the non-conchologist there were very large mussels, agar seaweed, the usual tangled long-lines, and a good collection of tumbled kauri gum of varying quality.

The successive days of collecting were busy and full of interest. The slowly increasing tides and eventually rougher weather showed us how soon the sea may return and claims its own.


COOK ISLANDS
Penrhyn
Rakahanga
10°
Pukapuka
Manihiki
Nassau
Suwarrow
0 100 200 300 400 500
Kilometres
Palmerston Atoll
Aitutaki
Manuae
Takutea
Mitiaro
20
Atiu
Mauke
Rarotonga
Mangaia
160°
2620 Kms to Auckland
D.L.

A CHECK-LIST OF THE MOLLUSCS OF THE COOK ISLANDS (Part 2)

J. Coles and N. Gardner

This completes the check-list of shells collected by ten members of the Conchology Section during a visit to Aitutaki (ten days) and Rarotonga (three days) in September and October 1980.

Shells include live, crabbed and beach specimens

A = Aitutaki R = Rarotonga

The assistance of Mr W. Cernohorsky with identification of specimens is acknowledged.

BIVALVES

Arca ventricosa	Lamarck 1819	A
Isognomon perna	(Linnaeus 1758)	A
Pinctada margaritifera	(Linnaeus 1758)	A
Pinna muricata	Linnaeus 1758	A
Chlamys sp.		
Limea fragilis	(Gmelin 1791)	A
Chama pacifica	Broderip 1835	A
Modiolus auriculatus	Krauss	A, R
Lithophaga teres	Philippi	A
Fragum fragum	(Linnaeus 1758)	A
Codakia tigerina	(Linnaeus 1758)	R
Lentillaria paytenorum	Iredale	A
Pitar pellucidus	(Lamarck 1818)	A
Trapezium oblongatum	(Schumacher 1817)	R
Tridacna maxima	(Roding 1798)	A
Periglypta reticulata	(Linnaeus 1758)	R
Tapes literata	(Linnaeus 1758)	A
Gafrarium pectinatum	(Linnaeus 1758)	A, R
Tellina vulsella	(Hanley in Sowerby 1846)	A
Tellina staurella	(Lamarck 1818)	R
Tellina virgata	(Linnaeus 1758)	A
Tellina sp.		A
Scutarcopagia scobinata	(Linnaeus 1758)	A, R
Quidnipagus palatam	Iredale 1929	R
Arcopagia robusta	(Hanley 1844)	A
Mactra sp.		A
Asaphia violascens	(Forstal 1775)	A, R

FRESH WATER

Melania tigrina	Linnaeus	R

LAND SNAILS

Bradybaena similaris	(Ferrusiac)	A, R (Introduce
Subulina octona	(Bruguiere)	A, R "
Omphalotropis sp.		A
Tornatellinops sp.		A

ADDITIONAL SPECIES OF COOK ISLAND MOLLUSCA

D. Lamb

In the small museum,attached to the library in Avarua on Rarotonga, is a handsome shell cabinet with a respectable collection of shells. I was advised that the collection was made by Julian Dashwood and as he was described as a talented cabinet-maker too, it seems likely that the cabinet was also constructed by him. When I viewed the trays of shells (all glass covered), I went back to the librarian and asked if by any chance there was an Accession Book giving details of the shells. She found this for me very quickly and allowed me to make very rough but fairly detailed notes.

The collection contains 203 species and includes the following species which were not found by our party :

GASTROPODS

Turbo petholatus	Linnaeus 1758	R
Modulus tectum	(Gmelin 1791)	R
Strombus lentiginosus	Linnaeus 1758	R
Strombus dentatus	Linnaeus 1758	A
Strombus thersites	Swainson 1823	R
Lambis truncata sebae	(Kiener 1843)	R

Lambis chiragra	(Linnaeus 1758)	Pukapuka
Cypraea arabica	Linnaeus 1758	Atiu
Cypraea bistrinotata	Schilder & Schilder 1937	R
Cypraea carneola	Linnaeus 1758	R
Cypraea cumingii	Sowerby 1832	Atiu
Cypraea depressa	Gray 1824	Manihiki
Cypraea dillwyni	Schilder 1922	Mauke
Cypraea erosa	Linneaus 1758	R
Cypraea goodallii	Sowerby 1832	A
Cypraea irrorata	Gray 1828	Manihiki
Cypraea mariae	Schilder & Schilder 1927	R
Cypraea poraria	Linnaeus 1758	Atiu
Cypraea scurra	Gmelin 1791	Mauke
Cypraea subteres	Weinkauff 1881	Mauke
Cypraea talpa	Linnaeus 1758	R
Cypraea teres	Gmelin 1791	Mauke
Cypraea testudinaria	Linnaeus 1758	R
Cypraea ventriculus	Lamarck 1810	A
Cypraea vitellus	Linnaeus 1758	R
Ovula ovum	(Linnaeus 1758)	R
Cypraecassis rufa	(Linnaeus 1758)	Pukapuka
Casmaria erinaceus	(Linnaeus 1758)	Mauke
Tonna perdix	(Linnaeus 1758)	R
Bursa cruentata	(Sowerby 1835)	Mauke
Cymatium pileare	(Linnaeus 1758)	R
Cymatium rubeculum	(Linnaeus 1758)	A
Charonia tritonis	(Linnaeus 1758)	R
Thais intermedia	(Kiener 1835)	Atiu
Vexilla vexillum	(Gmelin 1791)	R
Coralliophila erosa	(Roeding 1798)	A
Coralliophila bulbiformis	(Conrad 1837)	R
Nassarius hirtus	(Kiener 1834)	R
Vasum sp. (armatium ?)		Pukapuka
Harpa davidis	Roeding 1798	R
Mitra mitra	(Linnaeus 1758)	A
Mitra ambigua	Swainson 1829	A
Mitra coffea	Schubert & Wagner 1829	A

Mitra colombelliformis	Kiener 1838	A
Mitra cucumerina	Lamarck 1811	Manihiki
Mitra ferruginea	Lamarck 1911	R
Pterygia crenulata	(Roeding 1798)	A
Pterygia nucea	(Gmelin 1791)	A
Pusia cancellarioides	(Anton 1839)	Atiu
Pusia tuberosa	(Reeve 1845)	A
Conus adamsonii	Broderip 1836	R
Conus aulicus	Linnaeus 1758	R
Conus auricomus	Hwass in Bruguiere 1792	R
Conus bullatus	Linnaeus 1758	R
Conus capitaneus	Linnaeus 1758	R
Conus cylindraceus	Broderip and Sowerby I 1830	A
Conus distans	Hwass in Bruguiere 1792	R
Conus eburneus	Hwass in Bruguiere 1792	R
Conus geographus	Linnaeus 1758	Pukapuka
Conus glans	Hwass in Bruguiere 1792	Atiu
Conus imperialis	Linnaeus 1758	R
Conus leopardus	(Roeding 1798)	R
Conus litoglyphus	Hwass in Bruguiere 1792	A
Conus marmoreus	Linnaeus 1758	R
Conus miles	Linnaeus 1758	Atiu
Conus mitratus	Hwass in Bruguiere 1792	A
Conus nussatella	Linnaeus 1758	Atiu
Conus pennaceus	Born 1778	R
Conus pertusus	Hwass in Bruguiere 1792	Mauke
Conus retifer	Merke 1829	Atiu
Conus sanguinolentus	Quoy & Gaimard 1834	R
Conus scabriusculus	Dillwyn 1817	Mauke
Conus tessulatus	Born 1778	A
Conus textile	Linnaeus 1758	R
Conus vexillum	Gmelin 1792	R
Conus vitulinus	Hwass in Bruguiere 1792	R
Terebra babylonia	Lamarck 1822	R
Terebra dimidiata	(Linnaeus 1758)	R
Terebra guttata	(Roeding 1798)	R
Epitonium sp.		
Pyranidella terebellum	(Mueller 1774)	R
Bulla ampulla	Linnaeus 1758	R

Bulla vernicosa (?)	Gould 1859	Mauke
Bulla sp. (scabra?)		R
Haminoea sp.		A

BIVALVES

Spondylus sp.		Penrhyn & Suwarrow

CEPHALOPODA

Spirula spirula	(Linnaeus 1758)	A

Shells named as *Rhinoclavis kochi* (Philippi 1848), *Cypraea eglantina* Duclos 1833 and *Cypraea histrio* Gmelin 1791 are included in the collection but appear to be misidentified.

Where several sets of the same species were displayed, I have given preference in the list to those from Aitutaki and Rarotonga as these were the islands where we collected. Those shells from Pukapuka or Danger Island probably reflect its more northerly and western situation in relationship to the areas we visited, and suggest a rich collecting area.

There are 87 species in the above list that were not collected by our party, although at least three of those were found as badly worn or broken pieces (there was quite a degree of competition to try to beat President Bob Grange as the finder of the biggest piece of *Tonna perdix*, but he kept on improving his finds!) Some 54 species collected by our party are not present in the Rarotongan Museum collection.

WITH PROF. MORTON IN BRIGHTEST FIJI

A Report on an Ecology Field Course in Fiji

by Fiona Thompson

In the August vacation, it was my pleasure and privilege to join third year Zoology students from Auckland University on their tropical ecology field course. There were 14 students, Professor John Morton, John Walsby, Shirley Martin, Peter Ohms and myself, a very amateur enthusiast.

We were met at Suva Airport by Dr Uday Raj, the head of the Marine Research Institute, a part of the Natural Resources Department at the University of South Pacific, together with some of his students. We all piled into the campus bus which took the boys to their accommodation; the girls to their hostel, distinguished by a notice saying "Naughty girls

will be put out to make way for better"; and ourselves to one of the USP Guest Houses, an old RNZAF house ten minutes' walk from the MRI and the jetty.

We had lectures each day, either morning or afternoon depending on the tide and the day's expedition, and often evening as well. Our programme included taking the MRI boat "Nautilus" either to a part of the reef or to an island. So our first day, after a 9am lecture introducing reef ecology, took us to a narrow part of the channel reef near the wreck of an old ship, going in thigh deep from the punt and drying out in time to get wet coming back. My first shell was a *Homalocantha zamboi*, eroded, encrusted, but still with its operculum. I must confess I was usually way behind everyone else, there was so much to see and absorb. Shirley and I had brought perforated kitchen spoons, very useful when you weren't sure what "nasties" lurked under ledges. Some of the students went snorkelling over the reef edge, in fairly strong surge, though relatively calm this day. Hamish Spencer turned over hundreds of rocks, finding tiny pink murex and purple turridae. I poked in numerous pools and was pleased to find two live trivia. We were both invariably last back to the boat.

That evening we were joined by William Muntz, a zoologist from UK who had spent the previous month working on Nautilus at MRI.

The second day we went to a patch reef further East, wading through turtle grass with lots of holothurians, then the dead reef, an incredible lunar landscape with innumerable diademosa. We took one holothurian, dissected, back with us, a *Thelanotus ananas*, and had it for lunch next day, cooked in coconut milk, chili, onion and tomato by the delightful Fijian lass who looked after us in the Guest House. We also had octopus stew, fried breadfruit and salmon and seaweed(canlerpa) salad.

On the Wednesday we went out in two parties, ours leaving at 7.30am to the Nautilus cages, set the previous day at 350 fathoms and 250 fathoms. Our group retrieved 7 nautilus, 3 sharks, 1 eel and lots of very pink deep water shrimps, as well as an unusual pink sea urchin which Dr Raj had only seen once before. The second boat collected 6 more nautilus and a rare single polyp coral. All the nautilus were swimming happily by the time we returned to the jetty. We also acquired another student from Bristol University, whose Professor is John Walsby's brother. Andrew's lecturer slept in and he had been waiting at the jetty when we left, so he joined us.

That afternoon we went out to a sandbank island, Nukuboca, with its tiara of vegetation. The reef extends out from this island, but this day we were sieving amongst the turtle grass. There were a few rocky ledges here, from which I found a live pearl oyster - but no pearl. The flat, sandy area had augers, strombs and nassarids in profusion on the tide line, but it was not until we were back in the boat that I realised most of them were inhabited by hermit crabs.

That evening an Australian accountant came to stay in the Guest House too, and he found it disconcerting eating with the scrabble of these crabs, albeit confined in screwtop jars. These I kept inside. Hamish and I spread the live specimens outside on the verandah.

I spent Thursday morning bleaching corals to send back to Auckland with some of the excess bits and pieces, so I missed the morning lecture. We went back to Nukuboca that afternoon, this time going out to the reef edge, where the dead reef was predominantly brittle stars. Each part of the reef is noticeably different and here we found more cones and trochus.

It rained all night, but by Friday morning it had cleared, and after a sightseeing and shopping trip into Suva and lunch, we had a lecture on crabs and other crustacea and walked along the shore towards Suva Point where there is a knot of mangroves. There were dozens of *Uca lactea* with their bright yellow claws, and although we were walking well back and above them, they froze as we passed. Out to the low tide mark, we sieved for bivalves in fine black sand. The majority of bivalves seemed to be dead already, perhaps because of the rubbish thrown round the mangroves. Some had been bored by the natica and polinices which abounded. We found *Nassarius zeuxis* on the sea grass here and *Melampus*.

A lecture on corals this morning, then a rush into Suva before the shops shut at 1pm. Hamish and I made a beeline for the Fish Market, which we were told was only on Friday and Saturday. Later, when we went through the Handicraft Market, we found that $2 for a *Scorpion lambis* was very reasonable. Home then for the turtle casserole Camille had cooked, with kokoda. Later that afternoon, some of us explored the breakwater, looking for barnacles and limpets. We did find *Morula*, though there was far more variety back at the jetty with the tide out.

After an early lunch on Sunday, we went by bus to Mt Korababa. This is rainforest and had a fresh swathe of logging tracks going up, precipitately. We all started ankle deep in dark red mud, most of the others going off at a good pace, myself puffing and feeling eldery and pleased that John Morton and Savla, the Fijian botanist, stopped to explain, thus giving us time to go on at a slower pace, which we did till the tracks diverged. While we waited and waited for the others to join us, I poked round and found four different varieties of land snail. Hamish found three, but so far they have not been identified. The old track crossed a stream thick with mud, and after considerable debate we struggled through - knee deep in red mud. John Walsby and Hamish bringing up the rear, walked a few yards downstream and crossed it dry. The rest of the climb was relatively easy with tree root stumps for steps. The view back over Suva and the reef was superb. It took two hours to climb the 2,000 ft and three-quarters of an hour to return.

The tides were low in the mornings by Monday, so we set off at 7.30am for Nukulau Island. This is a lovely touristy island with an historic background. At dead low tide the reef connects it with Makeluva Island, the next island around, but by the wharf it drops sharply. The students botanised on this island and then swam and dived. I circumnavigated it on the tide line.

After lunch we went on to Laucala Island, more mangrove and mud, being part of the delta of the Rewa River. It has one small village, whose headman was delighted to welcome John back again and accompanied us round the island, showing us how they caught mud lobsters and where they played cowboys and Indians as boys. They knocked off fresh coconuts for us and were very hospitable. Very few shells here, a few *Nerita*, and a lot of mosquitoes.

Up the Rewa River next morning, where they found spiny *Murex*, *Oliva tremulina* and the *Neritas*.

Shirley and I went to the Suva Aquarium that afternoon, where I wrote down names of those shells I had collected.

Wednesday morning we inspected Makeluva Island, whose reef is a thin crust on coral debris with huge storm blocks on the rubble flat. We met our first stonefish here, although there was an immaculate one in the Aquarium. This one John prodded and poked with my perforated spoon to make it spread its fins. It maintained a dignified indifference.

That night at midnight we sailed on the barge taking the remaining gear down to Dravuni, an island in the North of the Astrolable group. This is a superb island, the epitome of a tropical dream, whose village had turned down offers of tourist development and asked Dr Raj to build a Research Station instead. Most of the equipment and building had gone down the previous week; this was the final instalment before the Station opened the following week. We had 46 passengers, all of us, Uday's staff, some families, and it needed care to thread one's way across the deck littered with sprawled, sleeping bodies. Fortunately for us, Shirley and I were offered a 2-berth cabin. On the return trip these were thankfully used by Hamish & Co.

We arrived at dawn - the barge running right up the clean sand - to a warm welcome, and were taken to one bure which belonged to the school teacher's widow. We all sat down on the floor and had breakfast of bread and marmite and tea - someone had forgotten the butter. We were given three bures to sleep in, hers and the chief's and another, and again we were fortunate. Mattresses had been brought down for the new lab and we had those in preference to the bed of hard planks covered with matting.

A kava ceremony followed, with speeches requesting permission to visit their reef and to stay the night, most in Fijian. We also presented the food and kava root we had brought for the feast. Then over to a smaller island, thirty very wet minutes away. Hamish had been in the first party, and they were well round the rocks. This is a virtually uninhabited island, with a clearly zoned shore and incredibly clear water, and with a wide variety of species. We saw *lima fragilis* with bright red tentacles.

This was new ground for the Fijians too, and Dr Raj was keen to explore the fringing reef. For me there was just enough breeze to hide practically everything except the blue *Linkia* starfish which John Walsby was inspecting for *Thyca*, so I decided to return to the rockhounds. I was diverted by the tide line, which had hundreds of small shells such as *Atys*, *trivia*, limpets and small tests. This was so rich a hunting ground that I missed my lunch and a swim, remaining on all fours, and still didn't reach the other end of the beach before the boat left.

Back at Dravuni, the village put on a feast for us - chicken, pigs, yams, breadfruit, pineapple, watermelon and curry made by Uday's Indian secretary, and gula gulas. There was the ceremonial switching on of the generator, the first electricity the village had had, brought over for the lab. Later, after a council meeting, the women sang their action songs - no music, only clapping. Then the tara-la-la, dancing till 3.30am, but only the young stayed up till the end. The barge left at dawn, again bodies littered the deck for a perfect journey, clear water and sun, returning at 1pm.

Saturday morning we went down to the lab to clean up and to thank Dr Raj and his staff for their magnificent organisation and co-operation, then into Suva for last minute shopping and a quick visit to the Fish Market. Hamish and I spent the afternoon cleaning the nauseous vesicular remains and packing our shells. One of my hermits spent a night of freedom and I found him twelve hours later having climbed down the steps of the verandah. Most of the others went to watch the last Parade of the Hibiscus Festival, though a few visited the Bat Caves.

Very early next morning we left for Nausori Airport and had to wait for thick fog to lift. Despite my screwtop jars and sealed bags, the slight aroma of decaying shells accompanied us. I'm sure it facilitated my swift passage through Customs - and so home to continue the cleaning process.

Postscript:
One of the students left the remnants of his sandshoes in case someone was desperate. Dr Raj wrote to say they used them in the Nautilus traps and had never had such good bait!

(Photographs on Page 27)

AUSTRALIAN LAND SNAIL ODYSSEY

by Helen Stewart

Shell collecting is rather frustrating while one is on a safari coach tour. Nevertheless, in 1978 while on one of these really quite enjoyable tours through the Centre and 'Top End' of Australia, I managed to accumulate a reasonable number of land snails. This was accomplished, I admit, chiefly by enlising my fellow 'coachees' in this - to them - rather intriguing occupation.

Our first find was in a dry billabong about 10 miles from Birdsville on the edge of the Simpson Desert, where we stopped for lunch 'in the shade of a Coolibah tree'. First one, then another, of my fellow travellers approached with literally handfuls of *Notohala* sp., whose inmates, alas, had been literally cooked by the 40° temperatures.

The next find, on the edge of a swamp near the Obire Rocks near Jim Jim, were dainty, almost transparent snails. These I have been unable to identify, although Bill Taylor and I have argued about them for several years. Our last - and best - camp in Arnhem Land, by the South Alligator River with its magnificent falls and herds of water-buffalo snuffling around at night, brought my most exciting find. My friend came to me very excited the evening before we left: "Helen, come and see this bird's nest with snail shells all around it". There, under a tree, was a perfect bower-bird's nest with, in the 'playground' in front, dozens of *Xanthomelon honum*, their bluish whitness shimmering in the twilight. I just gazed in amazement, and took only six!

The following morning, I was lucky enough to obtain a slide of the nest, bird, shells and all! Darwin was rather an anti-climax after that, except that I found a few interesting small shells on Mindil's Beach, and witnessed a truly magnificent sunset. I really fe l in love with my country's Centre on that trip. So much so that I vowed that, some day, I would live in Alice Springs - except that it is too far away from my beloved beaches.

While on a brief visit to Sydney in 1979, I had a most amusing experience concerning a snail. After collecting a varied and interesting number of shells at Cronulla, I placed still-alive shells under a tree in my friend's garden at Yowie Bay, which is adjacent to the Royal Sydney National Park. Cleaning operations completed, I carefully packed the shells in plastic cartons, declaring them to Customs in New Zealand. To my horrified guilt and dismay, when I opened one of the cartons at home, out popped a very much alive native Australian snail (*Cionella lubrica*, I think). Of course, I placed him in meths immediately, but will never be able to look a Customs officer in the eye again.

My second exciting find occurred during another safari trip up the Queensland coast in 1980. Off from Urangan is Fraser Island. This is the largest sand island in the world and a most fascinating place. The coach party was taken by four-wheel drive vehicles along tracks which by no stretch of the imagination could be called roads. Soaring to the clouds all around the island was the tall rainforest of turpentine trees, used - so it is said - in the construction of the Suez Canal.

There are 45 freshwater lakes on the island, with many beautiful streams lined with ferns. At one of the lakes, I issued my usual instructions about shells. Up came one little boy grasping a prize in his hand. "Is this what you wanted, lady?" Bless him, it was - an extremely handsome *Bentosites blomfieldi* (H 33mm, W 40mm). He would not take anything for it, either. That was the only decent land snail I obtained.

Another somewhat lucrative area, if one has the time, is Carnarvon National Park - a veritable fairyland. I found one rather dilapidated snail and showed it to the Ranger. He didn't know the species, so I did a swap - identification to be sent back if I could take it home. Alas, bad packing reduced it to fragments. Perhaps next time?

I must conclude with perhaps the most embarrassing moment in my shell-collecting career - but not with a land snail. On the 1980 trip, we stopped at Sarina for lunch and were let off for half an hour to roam the beach. One of the men found a beautiful complete spondylus , which I viewed with green envy. "What will you give me for this shell?", he asked. I thought a moment. "A kiss?" I said, with a dubious glance at his wife. "Done", was the reply, so I am now the owner of that handsome shell for a price I'll bet no one else has ever paid!

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PHOTOGRAPHS TAKEN ON THE ECOLOGY FIELD COURSE IN FIJI

Closeup view of the Stonefish
with 'wings' extended but
spines still flattened

Retrieving the cages
complete with Nautilus and Fish

Live Nautilus specimens being inspected

POIRIERIA

Conchology Section
Auckland Institute and Museum

Volume 12 Number 1

C O N T E N T S

EDITORIAL

THE COLLECTOR

The enthusiasm displayed by some collectors is well captured in David Gibbs' article on his Easter holiday. The manner in which so-called non-collector members of the family assist us often amazes me. Often these are children, although I know of several parents who drive to the most out-of-the-way beaches to indulge their children's interests.

With conservation being practically a daily news item, we have all probably had some misgivings; presumably we have all managed to justify our collecting, at least to ourselves. The numbers generally taken by members of a responsible organisation such as ours should not have any serious effect on the marine communities, but we should be well aware of the drastic unseen damage that can be done by a radical change in conditions affecting a habitat and Norm Douglas's article gives us all something to think about.

Derek Lamb
Editor

PUBLICATIONS

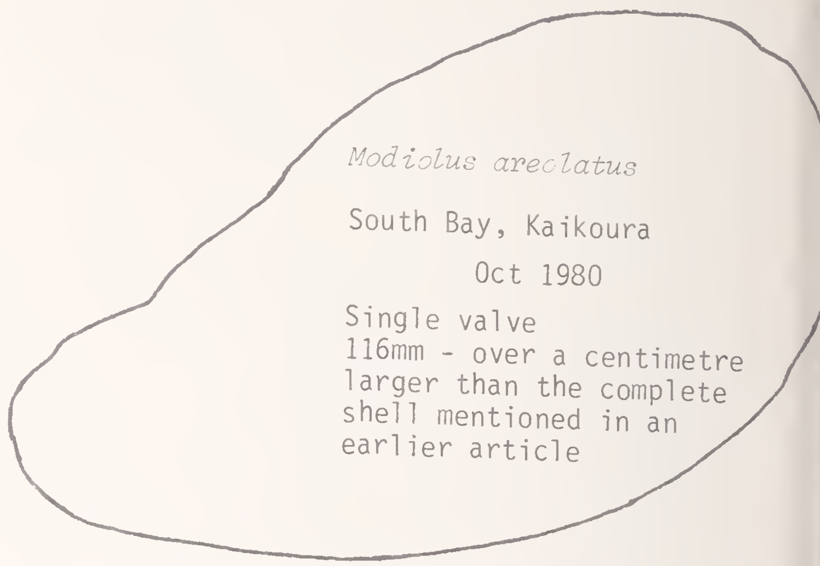
The New Zealand Oceanographic Institute has published a "Bibliography of Publications on New Zealand Mollusca (1973-1980)" by Dr R.C. Willan. This publication collates all the works on New Zealand Mollusca between 1974 (when Dr Powell's monograph "New Zealand Mollusca : Marine, Land and Freshwater Shells" was initially completed) and 1979. There are listings of some 435 articles by author, subject and systematic. Nearly 10 percent (42) of these articles are from POIRIERIA in the special Bulletins 1 and 2.

NOTES FROM KAIKOURA

by Beverley Elliott

I don't know whether shelling has been much poorer than usual at Kaikoura these last two years, or whether the lack of additions to my collection was due to my lack of effort and enthusiasm. It is difficult to remain enthusiastic when there's nobody with whom to share my finds.

But I didn't give up altogether, and two giant-sized finds were :



On Queen's Birthday weekend the Wellington Shell Club came to Kaikoura. Several weeks of calm sunny weather came to a sudden end just before their arrival, and Kaikoura turned on a typical winter weekend of icy cold conditions. They spent Saturday at Marfell's Beach in bitterly cold weather, and I am thankful I was not with them! On Sunday I put on more clothes than I have ever before put on for a shelling trip, and set off with them around Kaikoura Peninsula to Atia Point. Poor tides did not help, but there were numerous Limpets to collect, and *Buccinulum kaikouraense* under intertidal stones. The President, determined to collect *Diaphoraplax biramosa*, went for an unscheduled swim, but he seemed to think it was worth it, for one enormous *Diaphoraplax* and several normal-sized ones. I added a very nice *Lepsithais lacunosus* to my collection; 50mm, the largest I have seen. We continued walking around to East Head, where *Montfortula rugosa* was much scarcer than usual; however, I think everybody managed to find at least one. Then the land snail enthusiasts in the party dashed off to Mt Fyffe, to spend the last hour of daylight searching for *Wainuia fallai*, and several good specimens were found.

Monday was a little warmer, and for a short time glorious views of the snow-covered Seaward Kaikouras helped to compensate for chilly temperatures. More Limpets were collected, but most of the party balked at wading through two and a half feet of icy water to Seal Island. Those who took the plunge and followed me across were rewarded with a few fine large *Montfortula rugosa*, more *Buccinulum kaikouraense* and large *Cellana denticulata*. I found a very large live *Buccinulum pallidum*, 38mm, which was a surprise on such a poor tide.

All too soon my companions were gone, and how I wished they were here a week later, when there was a big washup of shells at South Bay. Lots of fine, large *Lunella* and *Haliotis australis*, and a few *Cookia* and *Eudoxochiton nobilis* were washed ashore. I was astonished to find a shell that I have never been able to obtain before in thirty years of shell collecting - *Cominella elegantula marlboroughensis* - a dead shell, somewhat worn, and with a hole in the body whorl, but in reasonable condition, and with a perfect protoconch.

More storms and more washups have followed, with shells including a fine large *Modelia granosa*, several *Argobuccinum tumidum*, many more *Haliotis australis*, and (in one day) five live *Eudoxochiton nobilis*.

Eighteen months ago a local fisherman brought me a number of magnificent *Poirieria zelandica*, 75 - 82mm in size, alive and in splendid condition. I cleaned them, and we shared them. Another fisherman produced a 7-inch *Haliotis iris*; I have found several 6½-inch, but this is the biggest yet. Contributions from local fisherman are few and far between, but recently I have had several nice *Astraea heliotropium* (crab inhabited) and a very nice Jewel Star, *Pentagonaster pulchellus*, from crayfish pots.

Thanks to the Wellington Shell Club for reviving my enthusiasm, and I hope there will be more visitors from time to time, with whom I can share this grand hobby.

ANOMIA WASH-UP AT ALGIES BAY

by J.R. Penniket

Family : *Anomiidae*

Genus : *Anomia* L. 1758

Anomia trigonopsis Hutton 1877
= *A. walton* Hector 1895
(Golden Oyster or jingle shell)

This is not a common species at Algies Bay near Warkworth. Specimens are to be found at very low tide on the rocky shelf between Algies Bay and Snells Beach, but they are only occasional. They are solitary, nearly circular, rather flat, about 60mm across, and the lower valve is greenish in colour; in fact, normal specimens for such a situation.

I was surprised, then, when the telephone rang on Tuesday morning 13 July 1982 and a friend offered the information that pairs attached to halves of *Chione stutchburyi* were banked up ankle deep against the launching ramp at Algies Bay. Other commitments prevented a visit before mid-afternoon, by which time and tide had come and gone, dispersing most, but even so a plastic bucket full was quickly gathered of medium-sized specimens - 30 to 40mm - clean bright pairs with the dead animal inside, most with the lower valve still attached and a considerable number stacked one on the other attached to a single *Chione* valve.

Deductions suggest a sizeable colony, probably on sandy flats outside the bay where the depth is 6 to 7 metres at high tide and the high winds of a few days earlier had brought them shorewards. This has not happened before in my thirty years collecting in the area.

Later at home, an attempt was made to establish the shape of the perfect specimen growing in an unrestricted situation. Taking the top specimens of the "towers" as probably free to grow without interference, such a specimen was estimated to be 35mm across, almost round in shape and some 7 to 10mm deep, the upper valve "coarsely radially corrugated" (Powell 1979). However, a considerable percentage had an end flexed upwards without apparent cause. Shells from inside the stack were variable both in shape and sculpture. Colour ranged from translucent white with a greasy appearance through pale yellows to bright orange, but only one specimen showed the characteristic green lower valve.

What causes this sudden explosion of population of *Anomia* in a locality where they have not been seen in quantity for half a lifetime is a puzzle. Will this be the Year of the Amonia? Last year was the Year of the Atrina!

PAKAWAU - EASTER 1982

by Beverley Elliott

Easter 1982 started with a howling gale all day on Friday 9th, but this was followed by three beautifully calm, fine days. On Saturday 10th, I stopped briefly at Pakawau Beach, North-west Nelson, to see if the strong wind had washed anything worthwhile ashore. To my surprise, the many species that are often common there were nowhere to be found, apart from two crab-inhabited *Aeneator otagoensis cookianus*.
Instead there were patches of fine beach drift containing numbers of small white semi-transparent shells, all of them alive. Commonest of these was the little bivalve *Theora lubrica*, of which I collected several dozen. Also fairly common were *Philine auriformis* (previously *angasi*) and *Philine powelli* (previously *auriformis*), both with a white animal somewhat larger than the shell.

Several of the larger bivalves were represented by numbers of tiny, semi-transparent juveniles; particularly *Atrina zelandica* and *Zenatia acinaces*. There were also two wee *Panopea zelandica* and one small *Offadesma angasi*. *Alcithoe* eggs were fairly common, including a *Maoricolpus roseus* with three eggs on the one shell.

EASTER WEEKEND AT WAIHAU BAY

by David Gibbs

Friday morning dawned cold and raining with the prospect of a cold walk along the beach in front of the motor camp. We walked for about a mile along the sandy beach at Oruaiti Beach, finding nothing at all along the recent high tide line. However, on the way back near the extreme high tide line I found a nice *Janthina exigua*. I showed this to my two children (aged 3 and 5) to see if they could find any more. A few minutes later my elder daughter found a beautiful big *Janthina globosa*, then my wife found one as well, both perfect. After arriving back at the camp, we tried to get warm and dry out over the cooker in the caravan before setting off to Lottin Point. Last Christmas, at this spot, I found an *Argonauta nodosa* and a *Marginella maoriana* while I was getting a few of the nice big *Cellana denticulata* which can be found here.

It was still raining when we arrived at the beach. At first glance there seemed to be nothing here except rocks and driftwood. After an hour's searching amongst the rocks, we had managed to find a couple of *Trivia merces*, two *Turbo granosus* (about 1" in dia.) and a nice fresh *Waimatea obscura* - found by Mrs, of course!

We arrived back at the camping ground at about 3.30pm. Again we tried to dry our clothes and warm up a bit. My parents arrived from Napier about an hour later, just in time to have a cup of tea before the power was cut off by the storm which had built up. This was to be our last hot drink for 24 hours, as already the storm had brought down trees in several places, cutting off the power to the whole of the East Cape area. This meant no lights, no showers, no water, no heat, with cold pies and sandwiches for breakfast, lunch and tea!

That night the wind was blowing so hard that thoughts of the caravan turning over passed through our minds. We survived the night, however, and next morning (still raining) we set off to explore the reefs around Waihau Bay. My mother has a keen eye for shells, so I showed her what a "Bean Cowrie" looked like. Within ten minutes she had found one and so had my wife. I was the unlucky one this time, but being the only shell collector in the family I benefited anyway.

After having more sandwiches and cold hot cross buns for lunch, we again set off for Lottin Point to see if the overnight blow had produced anything. It was still raining when we got to the beach, so I was the only one willing to go out and look for shells. Among the rocks I found

a further two *Turbo granosus* and another damaged *Waimatea obscura*. I had just about had enough of getting wet for nothing when a pretty-looking shell caught my eye. There lying on this bare shingle beach was a big *Balcis articulata*, slightly damaged on the back but the lip and tip were perfect. Surely this must be a southern record for this shell?

We returned to the motor camp expecting the power to be back on, but to our horror it looked like sandwiches again for tea. By this time at least we had hot water for tea, thanks to the camp manager who had got a fire going with a billy on for those who didn't have gas.

Sunday morning was beautiful and fine, so after breakfast of cold hot cross buns we walked along the beach opposite the camp, but again there was nothing. We decided to go and visit the lighthouse out at East Cape and to have a look at some of the beaches on the way back.

Along the road to Te Araroa trees had fallen, bringing down power and telephone lines. However, workmen had been busy cutting a path through, so at least the road was open. The township of Te Araroa was devastated, with the General Store's verandah lying halfway across the main street, and the petrol station's roof had been ripped right off. Two overturned caravans were also seen. The sea was still very rough near the Cape and the road was blocked about a mile short of the lighthouse.

As we had come so far, we decided to walk the last mile and forty minutes later we were at the top looking out over mountainous seas. The wind was still blowing a gale, so we only stayed a few minutes before heading back. I did plan on looking for fossils at Te Araroa, but it was raining again so we didn't bother.

We again stopped at Lottin Point on the way home, and as the rain had stopped it was all eyes to the beach. At last the lousy weather, cold food, no hot showers and wet clothes were worth it. In one little area of this beach was a small washup, most of the shells were damaged, but after an hour's searching we had found twelve *Marginella maoriana;* one of them was perfect and still had the animal in. At least another dozen were too broken to warrant collecting. Two more *Waimatea obscura* and five *Trivia merces* were also found. One other shell I picked up looked like a very small *Cabestana*. Mr Penniket now tells me it is *Turritriton labiosus*. Not a bad weekend's collecting, I thought. Guess where we are going for our holidays from now on?

(Somewhere where the sun shines? - Ed.)

SOME SHELLS OF SOUTH SANTO - VANUATU

by Noel Gardner

Recently, as members of a work party in Vanuatu, we spent a month on Tangoa Island, a small area of 150 acres of uplifted coral separated from the mainland of South Santo by a few hundred yards of very deep water "patrolled by sharks", we were told!

The inner side of the island slopes up to some 50 metres in height from a narrow, sandy beach edged by a small fringing reef which gives way to deep water close to the shore. A hurricane six months previously had done some damage and the quantity of Fungia - mushroom coral - and broken Acropora littering the shore had probably been thrown up then.

Live marine animals were very scarce and the undersides of rocks between tides were devoid of any life. Two species of Olive -*annulata* and *carneola* along with *Terebra felina* Dill, were crawling about in a small sandy area at low tide. The most striking phenomenon at half tide mark was the numbers of *Planaxis niger*, jet black and shining, forming a ribbon as they appeared from under small pebbles and pieces of coral strewn along the foreshore. As the tide receded further, these small littorina-like molluscs disappeared again under the stones and, indeed, must have burrowed well down away from the heat of the day, as they were very difficult to locate. Young *Nerita polita, N. plicata, N. undulata* and *N. chamaeleon* clung to stones near high tide, but most of the 200 species of molluscs we collected were washed ashore or inhabited by hermit crabs.

Our spare time during the month's stay was very limited. One afternoon was spent on and about the reef where a few large *Conus ebraeus, sponsalis, miliaris, miles* and *chaldaeus* nestled in crevices near the reef edge, along with the Murex *Chicoreus brunneus, Drupa grossularia*, a few Strombs and Morulas and one or two dark *Cypraea caputserpentis*.
A solitary large shell of *Conus marmoreus*, inhabitated by a hermit crab, was perched in splendour on a rock in the middle of a deep pool where the little electric blue fish darted about amongst the coral. We watched a sea snake, striped black and bluish white with a yellow head, as it searched about the stones and broken coral in the shallow pools. An egg mass belonging to Natica - probably *melanostomoides* - had been left in a sandy pool, and we saw numerous species of beautiful little crabs. One or two exotic Nudibranchs were living among the low tidal algae, but the most colourful sight was an example of bright red Hydrocoral edged with blue, jutting out from a large rock over the edge of the reef, with a single specimen of Linkia, the brilliant blue starfish, to complete the picture.

During siestas, when the tide was falling we spent a short time walking along the foreshore and having a quick look amongst the coral rubble where hermit crabs sheltered. Each time, we picked up a variety of shells in fair condition, many of which have been listed as "uncommon". The small *Strombus minimus* was one of the most common species here, and we were pleased to find good, fresh shells of *S. dentatus*.

The opposite side of the island, pounded by deep, heavy seas, consists of grey, very rugged, uplifted coral which made exploring extremely difficult. High up on the splash zone a few *Echininus cumingi* managed to shelter in crevices and one or two empty shells of the white limpet *Acmea conoidatus* were found. The only other apparent inhabitant of this rather forbidding area was a single specimen of *Nerita polita*.

Most of the island has long been cleared for habitation, but at either end a small area of heavy bush remains. Many of the ferns and plants covering the branches of larger trees closely resembled those in our New Zealand bush, eg Polykodium, and on the ground some species of Blechrum, Lycopodium, etc. A magnificent banyan tree, festooned with epiphytes and climbers, had a trail of termites which had built a brown covered tunnel up the tree trunk and out of sight amongst the branches.

As the bush gave way to the steep rugged rocks, we noticed plants of Peperomia, similar to our native species, living in much the same habitat. The only obvious land snail was a small brown and yellow *Helicina sublaevigata* (Pfr) on foliage beside the track. Time and circumstances did not permit us to look for any ground snails - and there were numerous plants of a nettle which were best avoided, growing in the undergrowth! The two small land snails *Bradybaena* and *Subulina* found extensively everywhere in the Pacific, had even found their way to this small island, along with *Truncatella*. Large *Pythia dollex* were living amongst leaves just above the shore.

On two weekend afternoons, Norman was able to get a lift by dugout over to the mainland where mile-long sandy beaches stretch on either side of the landing spit.

A glimpse of South Santo, Vanuatu
- looking toward Navota Farm

These beaches were quite bare of shells and washed by breakers, but at the end of the beach below Navota Farm were one or two specimens among accumulations of broken shells and coral. A small stream flows out here and along the banks among weed live large numbers of the long, sharply pointed, black water snail *Melania plicaria* and also *Clithron corona*, a Nerita-like snail with long reflexed spines circling the body whorl.

The South Santo area with its many rivers and streams has an interesting and quite extensive freshwater fauna. *Achatina fulica*, the large introduced land snail, is a nuisance and controlled to some extent with poison bait and the occasional "clean up" by the local people. We noticed these snails on the leaves of Taro plants and on the trip from Luganville our truck squashed a number of the shells as it careered along that bone-shattering road!

Among the more uncommon shells found on Tangoa Island were :

Conus pertusus Hwass

C. nussatella Linnaeus

Distorsio reticulata Roding

Mitra decurtata Reeve

M. coronata Lamarck

M. discolarium (Reeve)

M. contracta Swainson - a rare shell

M. ferruginea Lamarck

M. fraga Q & G

M. imperialis Roeding

M. pelliserpentis Reeve

Cancilla grandalina Lamarck

Vexillum granosum (Gmelin)

V. lucidum (Reeve) - a rare shell

Imbricaria olivaeformis (Swainson)

I. vanikoroensis (Q & G)

I. punctata Swainson (common here)

Strombus dentatus Linnaeus

S. minimus Linnaeus

S. microurceus (Kira)

S. pipus (Roeding) one washed up with animal, but shell damaged

S. plicatus pulchellus Reeve

S. terebellatus (Sby)

Nassarius puipinoides

N. cinclellus (Gould) - this was common here, also common in Fiji, but usually uncommon elsewhere

Terebra sp.

TOHEROA - A VANISHING MORSUS PAPHIES (MESODESMA) VENTRICOSA (GRAY, 1843)

by Norman Douglas (August 1982)

Recent news item: Fisheries inspectors find two specimens of Toheroa only, heralding another closed season for 1982

Newspapers giving graphic descriptions of gourmands, with sand flying in the air, as they feverishly compete for tasty morsels. Obviously these epicures were the culprits! So, a closed season.

But wait. It may pay to have a closer look.
We notice that while it is illegal to mount the "absolutely protected" native bird that the cat brings home, it is still legal to keep as many cats as we please to kill those "absolutely protected" birds. It is, in most cases, also quite legal for us to destroy the habitat of those "absolutely protected" birds.
Could it be that we have a parallel case upon our shores?

Bear with me a while and consider some of my seventy-two years' experience in living beside these one-time-prolifically-toheroa-inhabited west coast beaches. You may find something of interest in recollections, experiences and observations. Peradventure, even find another kind of scapegoat?

As a child I was brought up in Awhitu Central, which is near the west coast on the Manukau Peninsula and not far south of the Manukau Heads. The period referred to now is from 1910 until 1920. As you will recollect (?), this was in the horse and buggy days and our parents, with other settlers, could not travel far. Thus it was logical to have an annual picnic out at Irwin's Gap. After the midday meal, out came the heavy white cotton hand lines, all complete with large hooks and horseshoes for sinkers! Lines were coiled, trousers rolled up, a short wade into the first low waves and swish, the sinkers flew out a good twenty yards! Soon there were many snapper on the beach. Now isn't that a nostalgic recollection? What bait did they use? Well, Uncle Willie would take his long-handled fencing shovel and shovel out the 3 to 4-inch long toheroa while we children piled them up in a pyramid, re-digging out those that re-dug in! Yes, it is a nostalgic recollection. In those times, too, I remember a strip of low land, with some ponding, between the high sandstone cliffs and the high tide line. Now this has gone. Also, a few years after this time, a great gale from the south stripped the beach sand off to bare rocks and deposited it largely across the harbour entrance at Whatipu. While the sand has returned to make a beach once more, toheroa are now hard to find at Awhitu.

In 1921 my parents shifted from Awhitu to another farming venture, near the coast again, at Waiuku. Here, as I grew older and more able, my playground was largely the same west coast some 20 miles south of Awhitu. Here, at Taurangaruru (my home right now), I had a track down the cliffs up which I packed many thousands of mullet, sole, snapper and other fish to our home smokehouse and others. The bait was still sometimes toheroa for they were plentiful in this area.

I had the opportunity to study their way of life. It was most interesting to stand and watch the toheroa shifting station when the tide was almost full in. Dozens of toheroa would let themselves out of the sand, to be swept by the next wave to another location. Here they would up-end quickly and disappear under the sand where the retreating wave left them. And it was thus that I made a most interesting discovery - the half-inch baby toheroa live at a station not much lower than high water mark. They lived quite shallow in the sand an in great numbers. As they grew larger, they appeared to move further out towards half tide and finally, when 4 inches in length, they would be between half tide and low tide level. It became apparent to me that the surf-swept beach was their habitat.

We now come to 1940 and the war which greatly changed our way of life. American servicemen,training along our coast, made a good road almost to the beach. This was later extended to the beach, and cars and tractors roared along the beach, largely displacing the horses. From 1950 until 1980, motor traffic on the beach has simply multiplied. And what about the toheroas? Answer : there are no beds of toheroa now and I have never seen people gathering them for food for this last fifty years at Waiuku. Yet some remain, for during dry summer weather and a long period of calm seas, I may see a dozen dead ones along the high tide line in a six-mile walk.

Returning now to the immediate postwar period (about 1950): Good surf-fishing reels and rods appeared in our sports shops and a Waiuku Anglers Club was formed. Other surfcasting clubs were established at this time and thrived until, coinciding with a heavy increase of commercial coastal fishing, the snapper almost disappeared. However, while it lasted we had great fun competing with other clubs in field days to other areas. The areas concerned in this article are Muriwai and Ninety Mile Beach. We drove along the beaches in our cars. The tyres pounded over beds of tuatua [*Paphies (Mesodesma) subtriangulata* (Wood, 1828)], which were so numerous that they could not all get under the sand! We dug out large toheroa and photographed them standing on end and digging in. At the Ninety Mile Beach fishing contest each year, there would be four thousand fishermen scattered along almost its entire length, and maybe two thousand motor cars using the baby toheroa habitat for a highway. In fact, the baby toheroa habitat is now classed as a public highway, I understand, and up to twenty-two tourist buses (just to mention those alone) pass along this habitat almost daily in summer. The baby toheroa, just beneath the sand surface, would not be seen to be crushed, but how could it be otherwise? A Maori fisherman whom I met on the Ninety Mile told me the motor traffic was killing the baby toheroa. Knowing what I did, it was no trouble to agree with him.

So once more we see a case of the law prosecuting the gourmand for taking over his legal limit of shells, while the habitat remains completely unprotected! Motor traffic has killed millions of juvenile toheroa in an ever-open season until now fisheries inspectors can only manage to locate a couple of specimens.

So now we have a "closed season" on toheroa for 1982!
Do we?
Yet it has a humorous side! One day an elderly conchologist was honouring my humble abode with a visit. He was seen turning over and looking at a half-shell of prehistoric toheroa which was being used as an ashtray on my bench. The shell was over a quarter of an inch in thickness and six inches in length. After a while he made a dry comment - "You know, the toheroa used to attain a great size before the Maori reached New Zealand"! He did not mention the size attained now that the European has reached New Zealand - pulverized at less than one eighth of an inch!

For the toheroa, that once greatly esteemed morsel, the everlasting "closed season" seems imminent. They will be "absolutely protected"!

LAKE WAHI - CUCUMERUNIO WEBSTERI WEBSTERI (Simpson, 1902)

by Derrick Crosby

The summer of 1973/74 had been rather hot and as a result the lake levels in the Rangiriri-Huntly area were several feet lower than normal. And so it happened that a few members discussed the prospects and possibilities of a trip to Lake Wahi to look for the elusive freshwater mussel, *Cucumerunio websteri*! In 1971, Mr Norman Douglas had collected many dead shells on the water's edge and adjacent dry silt shelves, when the lake was low that summer, and after some discussion with Mr Douglas a trip was organised early in February. A group of eight members left for Lake Wahi to hunt the elusive *Cucumerunio websteri*.

After an uneventful trip to Rangiriri, Mr Douglas proceeded to direct us to the first of several localities where the mussel might possible be found.

After gaining permission to cross a farm, we duly arrived at the water's edge. The lake was obviously several feet below normal. Many lake birds were evident both on the lake and its immediate shores. Many damaged valves of *Hyridella menziesi* (Gray 1843) were strewn about and also Mr Douglas showed us more or less the area where he collected *Cucumerunio websteri* in 1970/71. Operations then commenced. We entered the water and almost immediately sank about a foot into sticky, odiferous, oozy black mud! However, after only a few seconds up came a beautiful specimen of *Hyridella menziesi*. This shell proved to be very common in the lake, with probably hundreds of specimens being inspected, and only the very best being kept. They were in good condition, good size - up to 85mm - and with good colour.

Activity continued and after a few minutes up came the first *Cucumerunio websteri*, a fine specimen. In the following two to two-and-a-half hours, six fine live specimens were found, the largest being approximately 80mm.

A lunch stop was eventually called and warm tea was enjoyed by all. After lunch we then moved on to another area further around the lake.

Typical shell collector's photograph
from an untypical locality -
Lake Wahi, February 1974

The lake bed conditions were similar to the first site, that is quite deep, very fine, black, oozy mud on a fairly firm clay basis. Several more fine specimens of *Hyridella* were found, and another two *Cucumerunio*. Unfortunately, time had run out and the homeward trip was commenced.

During the following week there was much discussion on the day's outing, and so despite rain during the week the following Saturday saw us heading towards Lake Wahi for a second assault. Upon our arrival it was evident that the lake had risen during the week. However, we had another search anyway, but only one or two *Cucumerunio* were located. The water was noticeably colder and a cold wind discouraged the kind of rummage which had taken place the previous week.

During the search member Alex Mannering came across a beautifully preserved Maori bowl carved from wood. The bowl was oval-shaped, about twelve to fifteen inches long, eight inches wide and four inches deep, with a one-inch handle on one end, and was buried in the mud. It is amazing just how sensitive to touch the feet became.

Member Richard Willan who came on the trip kept several specimens alive for many weeks in his aquarium, and they appeared to adapt well to a new environment.

SHELLING - ANCIENT AND MODERN - PORT JACKSON, COROMANDEL

by Patricia Langford

In January 1982, my family was holidaying on the Coromandel Peninsula, enjoying some fossicking for rocks, gemstones and shells on the beaches. We spent several fine but windy days camping at Port Jackson. The sea had previously been rough, as a considerable amount of kelp was washed up along the beach, and there were a surprising number of Porcupine fish (*Allomyeterus jaculiferus*) and Leatherjackets (*Cantherines convexirostris*) along the high tide line. There were surprisingly few shells to be found, only a few small *Haliotis iris, Cookia sulcata* of varying sizes, *Protothaca crassicosta, Zearcopagia disculus, Cantharidus purpureus* and *Mactra discors*.

Our attention soon wandered to two huge areas on the sand dunes that were abundantly scattered with millions of old shell remnants and stones. We wondered what kind of activity could possibly have deposited such mounds of shells in one area. Closer inspection revealed a number of bones lying scattered through the shells, then a complete human skeleton was noticed, barely covered by the constantly moving sands. We had not expected to find such obvious human remains among the ruins of so many molluscan feasts,

and the discovery cast a sombre shadow over us all. There were quite a few skulls, pelvic bones, long bones of arms and legs, and various bird and animal bones as well.

It was exciting to see obvious cooking sites, with the blackened stones still grouped in various places. The children soon detected pieces and flakes of obsidian, then we started to notice some interesting pieces and chips of other stones that had obviously been worked by human hand - beautiful agatised petrified wood and a lovely, mottled terracotta /redjasper. These were all very close around the fireplaces and cooking stones, but were not just cracked by heat. We had not known that the Maori people had fashioned ornaments or tools from such stones, but these pieces were well shaped, chipped and splintered.

We had searched various places without much success, as the weather was exceedingly dry, but lying in thousands all over the Port Jackson midden were thousands of bleached, empty *Rhytida* shells, some still with their brown periostracum. It was interesting to see that the Maoris had gathered so many of them as food, in days gone by.

We gathered up a few of each type of shell from the midden site - *Haliotis iris, Haliotis australis,* huge *Turbo smaragdus, Cookia sulcata, Nerita melanotragus, Haustrum haustorium, Thais orbita, Cominella adspersa* and *Paphies subtriangulata,* the latter being extremely abundant. I was specially interested to find huge, very old *Cellana denticulata* amongst the other shells. How had they arrived on a midden, among those other local shells? I had only seen such huge *Cellana denticulata* from Wellington and Kaikoura coasts. Had some Maori parties travelled from further south to Port Jackson, bringing the limpets with them as food on the journey? We could see no evidence of this species living on any nearby rocks.

We were so interested to learn more of this significant midden site that we called at a local Ranger's home and made further enquiries. We were told that the site had been well and truly picked over for many years by local people, visitors and archeological expeditions. Many interesting finds had been removed over the years, including bone necklaces, greenstone artefacts, flax woven articles, and large Moa bones. We had found some small Moa bones, and those of Kiore and Tuatara also, and one large, fossilised, claw-like Moa toe, which we brought home with our treasured agate, jasper and obsidian flints and stones.

We puzzled over the reason for complete human skeletons being buried in a coastal midden site, but I have since been told that many years ago, during severe influenza epidemics, large numbers of Maori people died suddenly and were often buried in such areas as the old midden site at Port Jackson, on the tip of the Coromandel Peninsula.

TO KILL OR NOT TO KILL

by Lilian Witterick

The Editor has mentioned our possible misgivings with the topic of conservation being so much in the public eye. Throughout the world there do appear to be quite a few shell collectors who, for various reasons, only take "beach" specimens or shells where the animal inside is dead or dying. Perhaps in their area the taking of live molluscs is prohibited or, as in my own case, they may feel reluctant to kill any living thing just for the sake of acquisition. It may seem inconsistent to kill living nuisances - flies, mosquitoes, ants and so on, but it is said that even St Francis of Assissi couldn't abide ants, mainly because of their organised, regimented busyness!

So we decided some years back to have a go at keeping an indoor substitute for a tidal rock pool, gathering our specimens from Auckland's East Coast beaches. The tank was set up early in 1974 and apart from a change to a larger tank at the end of that year, we have never looked back. It was certainly a case of beginner's luck - our knowledge of marine life was practically zero at that time.

Over the years we have watched all sorts of weird and wonderful small creatures. The bonus that comes with this form of study is that any animals who are obviously not thriving can be smartly returned to the ocean. Such failures, though, have been surprisingly few.

The common shrimp found in all rock pools settles down so quickly to "adoption" that it will accept from a pair of tweezers scraps of protein food (raw or cooked fish and raw meat) on the same day of being introduced to the tank. Crabs, hermit crabs and small fish take a little longer to become "pets". We only kept *Aplysia* once as it it is difficult to obtain the growth upon which this animal browses, but the pair we had did live for quite some time in the aquarium and appeared to relish our offerings of strands of *Entremorpha*.

Our own Loch Ness Monster is a ribbon worm which only surfaces occasionally, its original length on our first acquaintance being about four inches. At one time, after not having seen it for four years, I spied it one evening emerging from the depths. The length that one could actually see was about fourteen inches and still the end of it was not visible.

One of the most fascinating inhabitants was a specimen of *Monoplex australasiae*. This hairy triton was placed in the tank in early summer and fed on live bivalves procured for its diet until the following April when it burrowed deep down in the shelly bottom. In the August it surfaced and resumed feeding - until the next April, when the "hibernation" pattern was repeated and once again the winter "fast" ended in the following August. The fourth time this annual cycle occurred, the *Monoplex* burrowed earlier than usual - in March; in September it still was not very active and it finally died in the November.

Specimens of snapping shrimp brought from Shakespear Bay, Whangaparaoa - *Alpheus novaezealandiae* - keep busy for months on end building their galleries and providing much entertainment. They, too, eat fish or meat particles dropped into the tank, as also do cushion stars and sea-anemones.

Nowadays we only keep invertebrate specimens. These are generally so hardy and do not suffer during any sudden power failure or aerator blockage. Fish, of course, are more vulnerable. I became quite fond of one rock cod, *Acanthoclinus quadridactylus*, which grew well and lived with us for three years before dying.

Our best investment in equipment has been a protein skimmer. Originally, we changed part of the sea water every three weeks or so, but with the skimmer the water is seldom changed. However, as the water evaporates, we add fresh rainwater to reach our "plimsoll line", or else some of the Lake Pupuke water that seeps through the rocks down on Thorne's Bay near Milford, where *Entremorpha* species thrive. This addition of fresh or brackish water helps to keep the salinity level from becoming too high.

When the aquarium was first set up, some of the rocks were dotted with the tiny *Spirorbis*, some of which seemed to have tiny red "traffic lights" turning on and off, with no particular pattern that one could discern. That is one mystery I never did manage to solve. No doubt there will be many more puzzles. I look forward to them!

RECENT LOCAL WASHUPS OF SIGNIFICANCE

by Patricia Langford

After a long absence of noteworthy shell washups, I was delighted to find an abundance of various shells on local beaches, some species seldom available, following the August 1982 storms. I visited a number of beaches and found the following three places worthy of a report :

TAKAPUNA BEACH

In the past few years there have been large washups of *Pecten novaezelandiae* after Easterly gales. These washups were greatest from the Boat Launching Ramp area to the Strand, but the beds must be depleted now, as only a few live *Pecten* were seen in August. Previously they came ashore in hundreds and the gulls could be seen dropping the scallops from a height, on to the concrete Boat Ramp, to smash them open. They were very quick to help themselves from my bucket, too, then fly above the concrete Ramp and drop the large shells until they broke open. I was certainly not pleased if the gulls happened to snatch one of the lovely, wine red *Pecten* from my bucket, as they are not often found, and some have an attractive, lacy, white pattern over the red shell.

Several young *Panopea zelandica* were found in August, also *Mactra ovata, Mactra discors, Tawera spissa* in many attractive patterns, *Diplodonta striatula, Gari lineolata, Anomia trigonopsis, Myadora striata* and young *Zenatra acinaces.* The most abundant species were thousands of *Gari stangeri* in cream, orange, pink and purple colours, and thousands of *Venerupis largillierti.*

I find Takapuna is an excellent beach for large, colourful *Glycymeris laticostata, Maoricolpus roseus, Venericardia purpurata, Felaniella zelandica* (sometimes pure orange). *Maurea pellucida* are also worth hunting for. I have found seven specimens there, and five of them were alive.

A couple of *Chlamys zelandiae* were attached to the bases of kelp holdfasts; also present were *Waltonia inconspicua, Serpulorbis zelandicus* and *Modiolarca impacta.* I picked up one good specimen of *Alcithoe arabica,* some well marked *Penion sulcatus, Struthiolaria papulosa, Struthiolaria vermis, Amalda australis, Amalda novaezelandiae, Trochus viridus, Dosinia zelandica crebra, Lithophaga truncata* and several dozen live *Buccinulum lineum* among the seaweed.

At the base of the Boat Ramp, living among the lava slabs were some very large, clean, well marked *Cominella maculosa.*

OREWA BEACH

The entire beach was littered with many hundreds of thousands of *Atrina zelandica*, and a huge number of live *Struthiolaria papulosa*, the largest washup of these species that I have ever seen. The other notable finds were a number of *Offadesma angasi* (mostly punctured by gulls), thousands of small, live *Zenatia acinaces*, a good range of all the Dosinias, including some excellent *Dosinia lambata* and a couple of dozen live *Dosinia greyi*, one reaching 52mm in diameter. *Tawera spissa* were busily digging in sand at high tide. *Gari lineolata* were there too, but the shells are eroded and dull. *Struthiolaria vermis* are quite uncommon and most seem like dwarfs of the species. *Crassostrea gigas* wash up, often attached to *Paphies subtriangulata*, which is very common, as is *Paphies australe*. A few of the East Coast *Paphies ventricosa* were also picked up recently. *Bassina yatei* here are usually worn, and not as attractive as the beautifully frilled specimens from Manly, Matakatia, Okoromai or other Whangaparaoa Peninsula beaches.

Several *Alcithoe arabica* and live *Penion sulcatus* were also collected, and a good number of *Cominella adspersa*.
Orewa is a good locality for *Cirsotrema zelebori* and *Pupa kirki*, and the area in front of the Surf Life Saving Clubrooms is a good place to look for them.

TE ARAI POINT BEACH

We visited this beach one Saturday in August, and had a truly magnificent day's shell collecting. It has taken several weeks to clean the huge haul of good specimens that we optimistically brought home.

There were hundreds of live *Monoplex parthenopeus* among the countless thousands of *Atrina zelandica*, also every possible colour and form of *Penion sulcatus* and *Penion dilatatus*.
A number of *Alcithoe arabica* were found, many with dark, vivid patterns, but the shells were often damaged. One noteworthy specimen is very similar to the former *Alcithoe swainsoni motutaraensis* type. There were a few live *Mayena australasia*, but their condition was poor, as were the only two *Charonia lampas capax* we found. Large *Struthiolaria papulosa* and *Struthiolaria vermis* were abundant, some of the latter were a beautiful, unusual purple/pink colour. *Austrofusus glans* were plentiful, and available in every possible colour and sculpture form. It was impossible to resist gathering them up in handfuls. *Gari hodgei* were also common, with many lovely colours and sunray patterns. A few *Gari stangeri* and *Gari lineolata* were present on the beach.

Specimens of *Cabestana spengleri* were small and mostly with hermit crabs, but a couple were a vivid orange colour, elegantly sculptured and rather shiny, so different from the large, ponderous mudflat or harbour specimens.

Large *Pecten novaezelandiae* in a full colour range, were also abundant, and there were heaps of *Umbonium zelandicum* and *Tawera spissa* valves. These were found to be hiding *Amalda mucronata, Xymene ambiguus, Waltonia inconspicua, Cellana stellifera* and the much prized *Columbarium spiralis.* We found four of this wonderful shell, the find of the day, of course.

A few each of the following species were collected - *Tanea zelandica, Diplodonta globus, Chlamys zelandiae,* giant *Cominella adspersa,* large *Venericardia purpurata, Divaricella huttoniana, Longimactra elongata, Bassina yatei,* one *Xenophalium labiatum insperatum* (alive, but sadly damaged), one *Xenophalium* of the former *collactea* type, and a reasonable number of *Xenophalium pyrum.*

A most interesting selection of albino specimens were found - three *Gari hodgei*(containing animal remains), two *Struthiolaria vermis* (one alive), one pure white *Pecten novaezelandiae* and a few white *Austrofusus glans.* The dazzling white *Struthiolaria vermis* is very beautiful and I was extremely pleased with this find.

This was the best shell collecting trip we had ever experienced.

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EDITORIAL

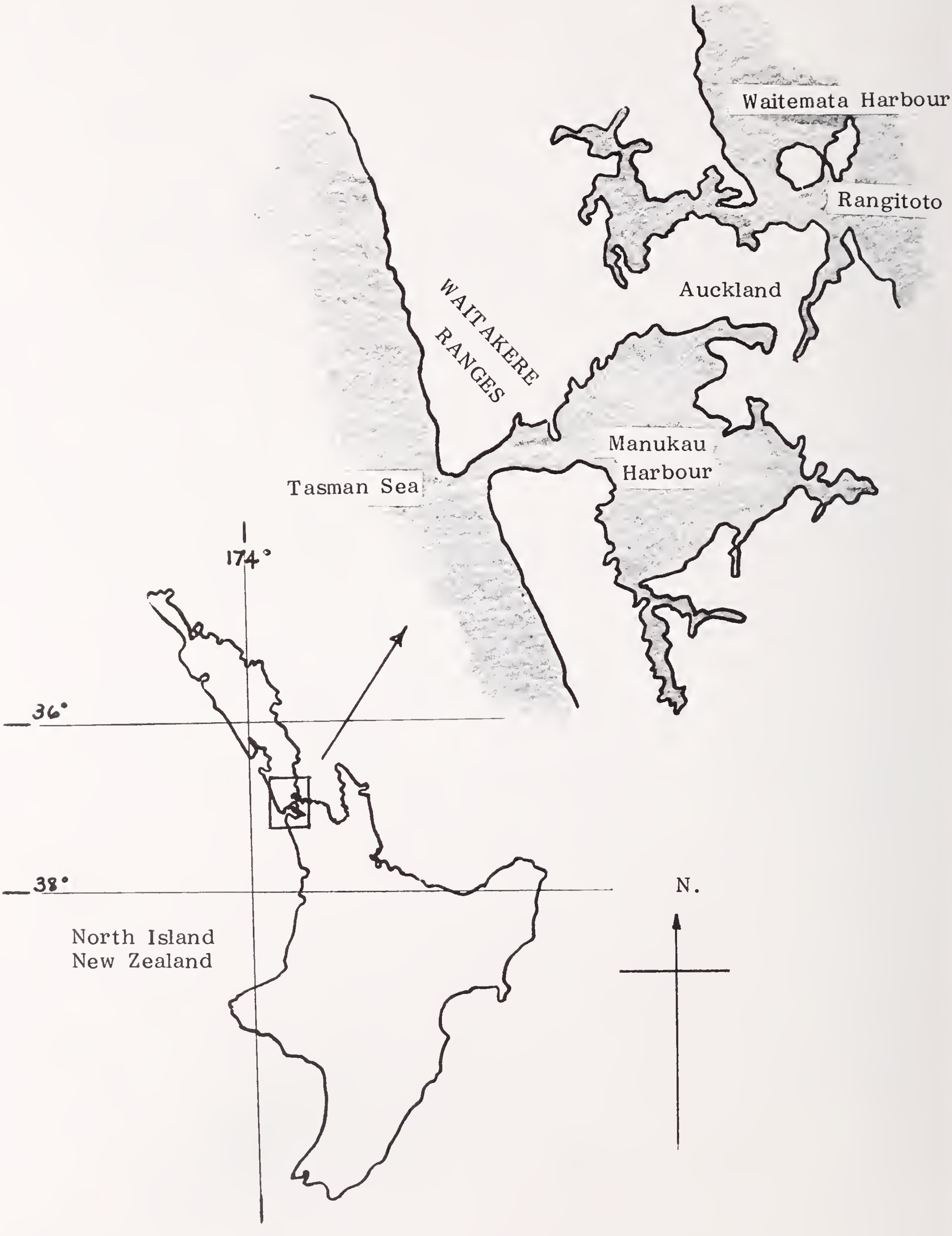
Waitakere Landsnails

Jim Goulstone's report on his time-consuming and arduous surveys of the small landsnail fauna of the Waitakeres is well worthy of a special issue of POIRIERIA. Many members have shied away from studying this section of our Mollusca because of the difficulties in classification. Now, with the numerous large-scale drawings (all Mr Goulstone's work) included in this article, members will have far more chance of identifying their specimens than previously. Virtually all the Auckland species likely to be collected (and indeed the greater part of any collection) are shown in the article in this issue. This should stimulate members' interest and result in more data being made available when required by further researchers.

Jim's work and publication on the smaller land snails, both on his own and jointly with Norman Gardner, have been prolific and give further justification for the existence of amateur organisations such as ours.

The Waitakere Ranges, known familiarly as the Waitaks to all Aucklanders, are so well known that preparation of the article was well under way before it was suggested that a map might be a good idea so that non-Aucklanders, and especially overseas readers, could see where the locality map "fitted in". The Waitakeres area is one of Auckland's finest jewels, the story of the logging of the kauris in this region part of our heritage, and we are indeed fortunate to have such a fine area of native forest so readily accessible for study and recreation.

Derek Lamb,
Editor


Waitemata Harbour
Rangitoto
Auckland
WAITAKERE
RANGES
Manukau
Harbour
Tasman Sea
174°
36°
38°
N.
North Island
New Zealand

WAITAKERE LANDSNAILS

J.F. Goulstone, 1982

Introduction

I have tried to present here an illustrated list of all those species of native snails known to be dwelling in the Waitakeres. I have collected most of them myself in the last 18 months, but have included one or two which have continued to elude me but which have definitely been collected by others. I hope the illustration of the shell with its accompanying remarks will make it easy for a reasonably diligent student to identify each species, though I freely admit that there are still some small punctids which won't give up easily. All my collecting sites are described with lists of numbers collected. Because of the nature of my collecting I did not see many introduced species and have not included them. Neither did I see any slugs nor visit the known localities of the introduced native Paryphanta busbyi.

Though the area is obviously being encroached upon by the city, enough is controlled Park or Waterwork Reserve to ensure the retention of a large area of bush and so a safe environment for the small native snails. At least in the Waterworks Reserve I have noticed a pleasing resurgence of the undergrowth due to good opossum control. Something which has been noted in the past and I can again confirm is the particular richness of species in that small gully leading down to Titirangi Beach. This beautiful little Reserve is nonetheless very vulnerable and will need particular attention if its unique features are to be preserved.

Earlier Work

It would be true to state that nearly everyone who has ever collected snails in New Zealand has visited the Waitakeres. A number of species were originally described from specimens taken here, for example Phrixgnathus cheesmani and Charopa transenna, and Suter lists countless snails collected in the Waitakeres, Titirangi, Swanson, Henderson, mostly collected by himself. Powell also mentions some typical small snails which could be found at Titirangi with 'names out of all proportion to their size in "Shells of New Zealand". Until very recently the main interest in our endemic snails has been the search for new species and their classification. In this respect recent collectors stimulated by F.M. Climo with his "Classification of the New Zealand Arionacea" have perhaps surpassed all the earlier workers and the species lists have blossomed. With the total number of species in New Zealand now in excess of 500, discoveries of new ones will slow and it seems inevitable that interest will shift to studies of communities, habits and life cycles of individuals, preferred habitats and food, interaction of species, interaction with other litter dwellers, predation and the like.

Morton has done a study of Cytora pallida probably collected from the Waitakeres in which he deduces food preference from stomach contents. But the work has hardly begun. The Conchology Section has had a number of field trips to Titirangi over the years, but little seems to have been reported other than a couple of lists of species collected in 1959 (Bulletin 15) and 1965 (Poiriera Vol 2, p94), though I have not checked the Bulletins before 1951 (1 to 6). I believe the good intention has always been there, for the editorial of 1952, mentioning a good start to the Manukau Harbour Survey, states ... 'Later it is hoped to start a detailed survey of the land mollusca of the Waitakere Ranges'. Dare I offer this work as a fulfilment of prophecy?

Names

This has been a problem because of the large number of new species and species under review by Dr Climo which have not yet been published. I have basically used Dr Powell's 1976 checklist but altered it when indicated by subsequent papers from Dr Climo. The punctid numbers of new species are those being used by Climo, all the other numbers and letters are my own. It is hoped that the illustration and brief remarks will be sufficient identificatio to enable the proper name to be added when the formal description is published

Acknowledgements

Dr F.M. Climo has freely supplied me with masses of information on his own work and the Waitakere survey would have been very much poorer without his encouragement. Others who have helped in some way include :
P. Mayhill, N.W. and E.N. Gardner, N. Douglas, H. Spencer, B. Hazelwood and D. Hole.

The Auckland Regional Authority Waterworks Division allowed me access to the Huia Catchment, which turned out to be an important area worthy of closer study.

L.Witterick has kindly undertaken the typing of the final copy.

CHECKLIST of SNAILS

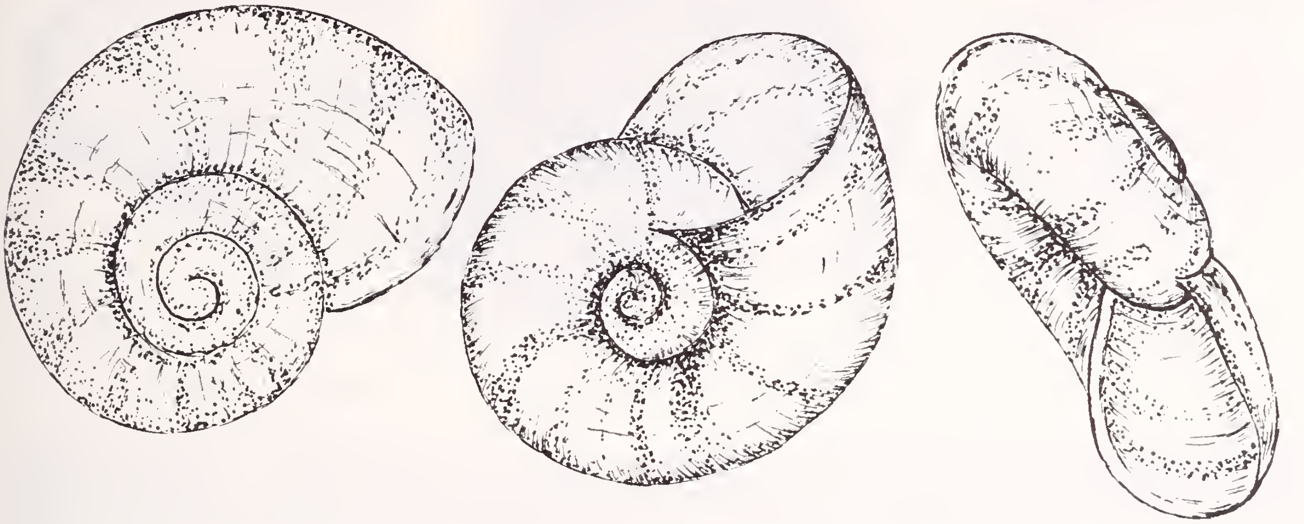
Delos coresia (Gray)
Delos jeffreysiana (Pfeiffer)
Cytora cytora (Gray)
" *hedleyi* (Suter)
" *torquilla* (Suter)
" *pallida* (Hutton)
" *fasciata* (Suter)
Tornatellinops novoseelandica (Pfeiffer)
Tornatellides subperforata (Suter)
Liarea egea egea (Gray)
Liarea hochstetteri carinella (L.Pfeiffer)
Omphalorissa purchasi (Pfeiffer)
Rhytida greenwoodi (Gray)
Rhytida dunniae (Gray)
Schizoglossa novoseelandica (Pfeiffer)
Otoconcha dimidiata (Pfeiffer)
Charopa pseudanguicula (Iredale)
" *cf. pseudanguicula*
" *cf. pseudanguicula (a)*
" *chrysaugeia* (Webster)

Charopa fuscosa (Suter)
" *coma* (Gray)
" *ochra* (Webster)
" *titirangiensis* (Suter)
" *transenna* (Suter)
" *pilsbryi* (Suter)
Huonodon hectori (Suter)
" *pseudoleioda* (Suter)
Cavellia buccinella (Reeve)
" *roseveari* (Suter)
Fectola infecta (Reeve)
" *mira* (Webster)
" *unidentata* (Climo)
Flammocharopa costulata (Hutton)
" *cf costulata (a)*
" " *(b)*
" " *(c)*
Geminoropa microrhina (Suter)
Mocella eta (Pfeiffer)
"Mocella" *1*
" *3*
" *4*
" *9*
Egestula egesta (Gray)
Therasiella celinde (Hutton)
" *tamora* (Cumber)
" *neozelanica*
" *cf neozelanica*
Suteria ide (Grqy)
Flammulina chiron (Gray)
" *cornea* (Hutton)
" *feredayi* (Suter)
" *perdita* (Hutton)
Therasia decidua (Pfeiffer)
Serpho kivi (Gray)
Thalassohelix ziczag (Gould)
Allodiscus dimorphus (Pfeiffer)
" *tesselatus* (Powell)
" *planulatus* (Hutton)
" *urquharti* (Suter)

Phenacohelix pilula (Reeve)
" *cf pilula*
" *ponsonbyi - giveni* (Suter - Cumber)
Laoma leimonias (Gray)
" *pirongiaensis* (Suter)
" *cf pirongiaensis*
" *marina* (Hutton)
" *cf marina*
" *poecilostica* (Pfeiffer)
" *cf poecilostica*
" *mariae* (Gray)
Phrixgnathus ariel (Hutton)
" *cheesemani* (Suter)
" *conella* (Pfeiffer)
" *erigone* (Gray)
" *francesci* (Webster)
" *fulguratus* (Suter)
" *glabriusculus* (Pfeiffer0
" *lucidus* (Suter)
" *moellendorffi* (Suter)
" *cf moellendorffi*
" *serratocostatus* (Webster)
" *viridula* (Suter)
Pasmaditta jungermanniae (Petterd)
Paralaoma lateumbilicata (Suter)
" *miserabilis* (Iredale)
" *caputspinulae* (Reeve)
Obanella rimutaka (Dell)
Punctid sp. *1*
" *5*
" *6*
" *7*
" *7a*
" *8*
" *15*
" *17*
" *29*
" *30, 32, 33, 38, 40, 55*

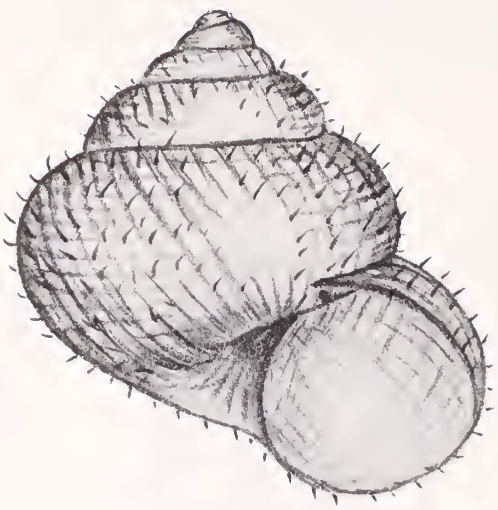
ILLUSTRATIONS of SPECIES

Delos coresia (Gray)
I found this to be widespread and numerous. It has mostly a smooth shiny shell with broad brown radial bands, but along the northern Manukau slopes there are a lot of plain yellowish specimens with seemingly heavier shells. 4.2 x 1.8 mm Titirangi

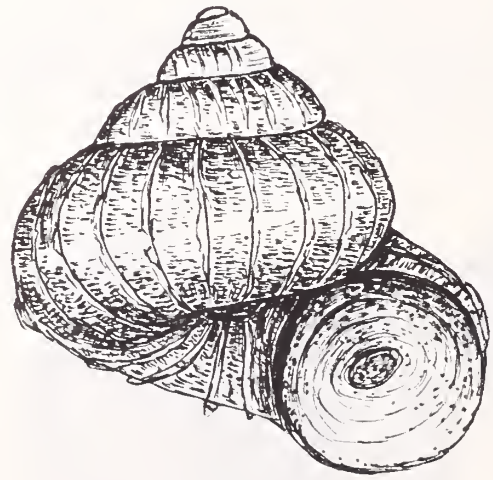


Delos jeffreysiana (Pfeiffer)
I could not find one authentic record of this species from the Waitakeres and did not find it myself. However, it seems incredible that it is not there and I have illustrated one from the Hunua Ranges. 6 x 3.5mm

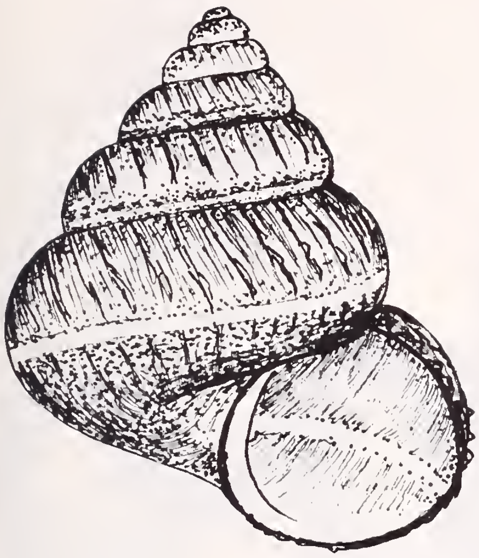
Cytora cytora (Gray)
This snail was quite scarce in my samples. 2.8 x 2.8mm Titirangi



Cytora hedleyi (Suter)
Abundant and quite magnificent in the Waitakeres. Though often worn off, the wide plate-like radial ribs when present are just as striking as the epidermal hairs on the previous species. 2.5 x 2.5mm Titirangi

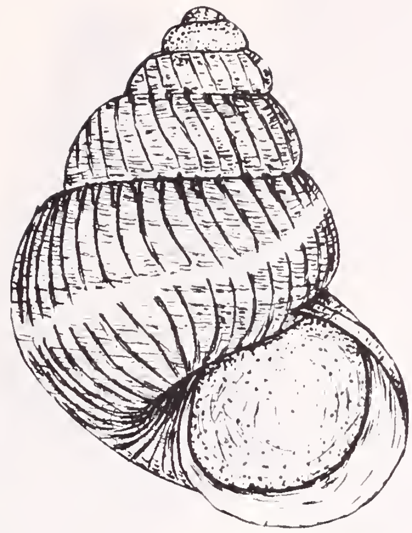


1.



.3.5 x 4.5mm Titirangi

2.



2.0 x 2.5mm Muriwai

3.

1.1 x 1.8mm Titirangi

1. Cytora pallida (Hutton
   The largest of the Waitakere Cytoras, which I did not find very often with its sharp ribbing intact. However, it was very common and could always be identified by the light band around the body whorl.

2. Cytora fasciata (Suter)
   This snail was only found at Houghtons Bush, Muriwai and fits in with a description of the species given by N. Gardner (Conchology Section Pub.1979 - A Distributional Guide to Genus Cytora). The species has been known only from Northland and Taranaki and this sighting could provide a link.

3. Cytora torquilla (Suter)
   The smallest of the Waitakere Cytoras and because of its size easily overlooked. It usually has its ribbing rubbed off, but with the deep sutures accentuating its whorls this tall little shell is most striking.

1. 1.2 x 2.3mm Waikowhai

2. 3.5 x 2.0mm Ihumatao

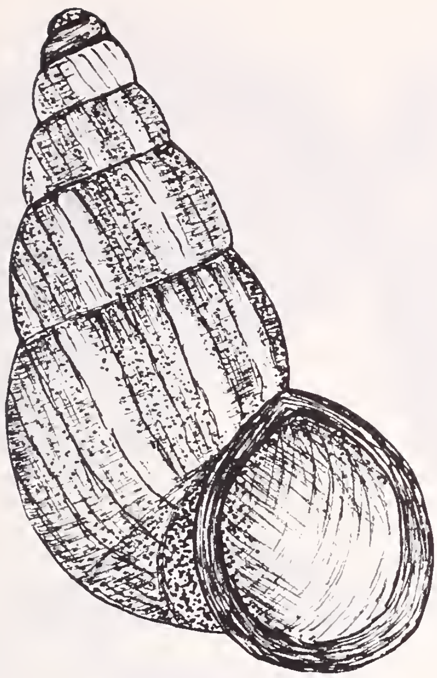
3. 1.3 x 1.9mm Scenic I

1. Tornatellinops novoseelandica (Pfeiffer)
   This was a common snail which seemed fairly tolerant of drier conditions and could very nearly be expected to compete with Cochlicopa lubrica in the suburban garden.

2. Tornatellides subperforata (Suter)
   I did not find this one, but it is in the 1965 "Poiriera" list and I have drawn one from just across the water at Mangere. Distinguished by its narrowly open umbilicus.

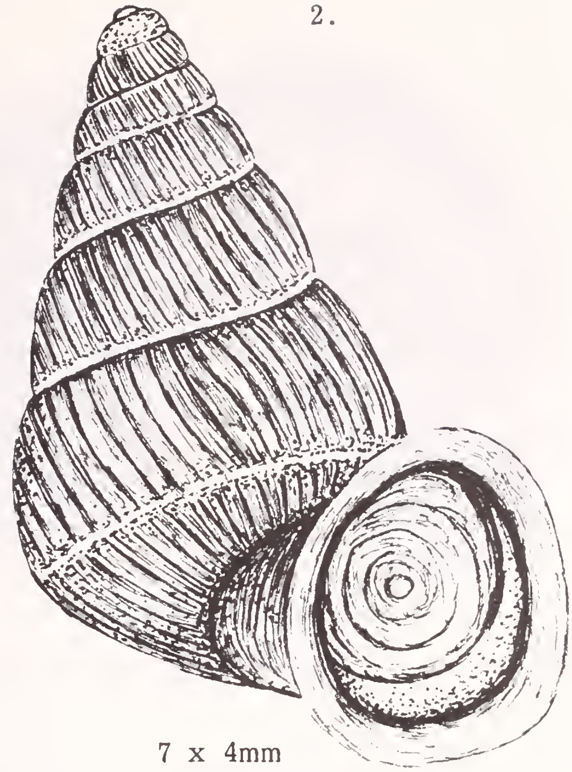
3. Omphalorissa purchasi (Pfeiffer)
   Although the species can be present in huge numbers in the litter, it appears to require fairly specific conditions.

1.



7 x 4mm Titirangi

2.



7 x 4mm

1. Liarea egea egea (Gray)
Perhaps a little sporadic but nonetheless prolific in places. At Mill Bay where the numbers were huge the shells were very eroded and the snails took on a very different appearance.

2. Liarea hochstetteri carinella (L. Pfeiffer)
Plentiful everywhere, particularly on the bush fringes in the scrub where other species tend to diminish.

juvenile 1.4 0.6cm

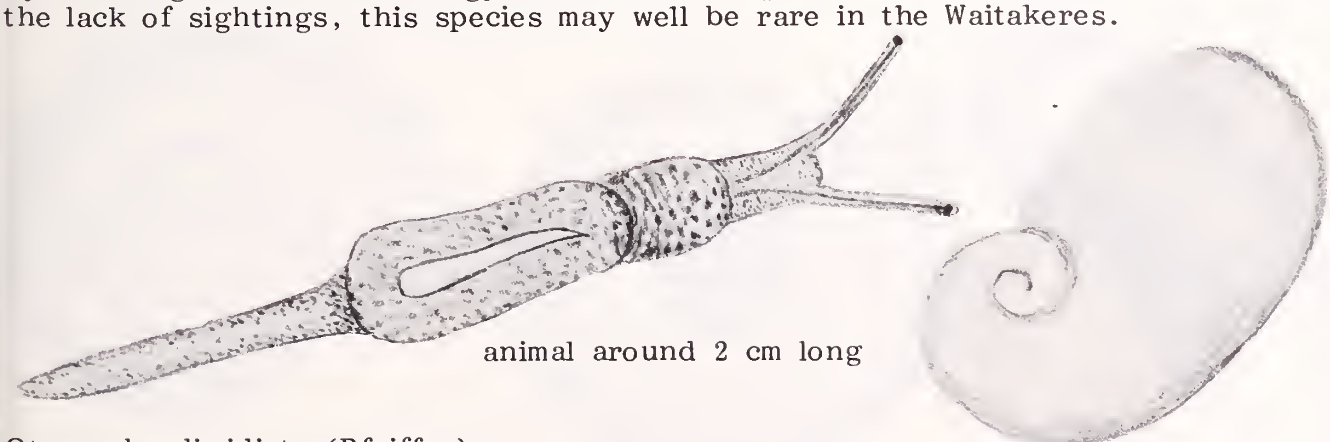
Rhytida dunniae (Gray)
I did not specially hunt for Rhytidas which prefer large heaps of litter, but noticed that dunniae was very common in the Huia - Kakamatua area. I have noticed that the large heaps of litter, while they might contain some Rhytida and some of the larger of the small species - usually very well grown - do not contain much else. Though I have thought Rhytidas to be more likely to eat worms, they probably keep the small snails down also in these heaps.

Rhytida greenwoodi (Gray)
I can't really say on the results of my survey what the state of this species is in the Waitakeres, but my guess is that it is very common. In the collection of the late G. Barker which he kindly gave to me is a large number of greenwoodi collected from Piha. All the shells I have seen have the darker brown circling the umbilicus, and though in other parts of the country this is not present I doubt that it has any significance.

Rhytida greenwoodi Piha 2.5 x 1.5 cm (Coll. G. Barker)

animal around 7cm long at rest

Schizoglossa novoseelandica (Pfeiffer)
I have not seen this snail in the Waitakeres nor heard of it being found, but there seems a reasonable chance of its presence so I have drawn one from a photo taken by N. Douglas on a Conchology Section field trip to Maracopa 1982. Judging from the lack of sightings, this species may well be rare in the Waitakeres.

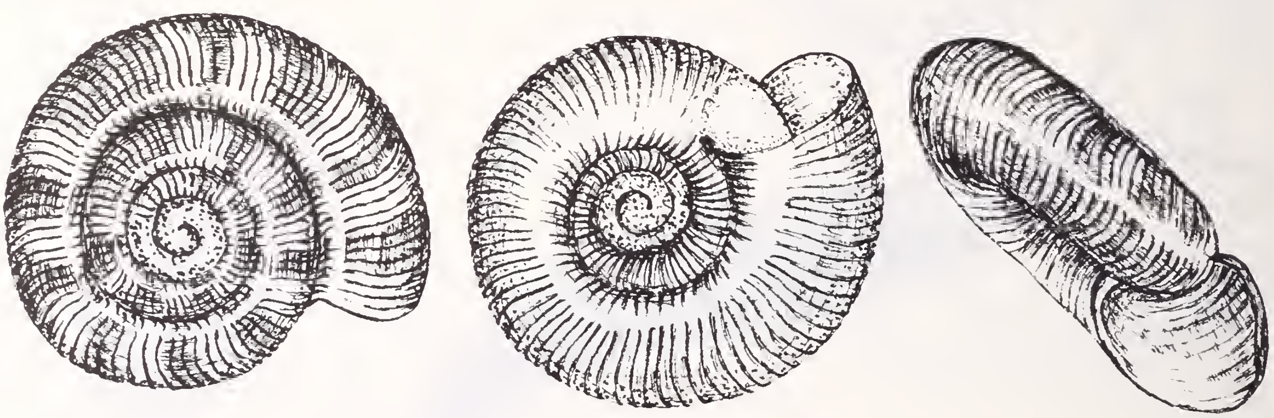


animal around 2 cm long

Otoconcha dimidiata (Pfeiffer)
Alongside the carpark at Titirangi has been a traditional spot to find these interesting little snails. When at rest the tail is curled around the shell giving the animal a circular appearance, and when disturbed the snail twists and turns quite violently.

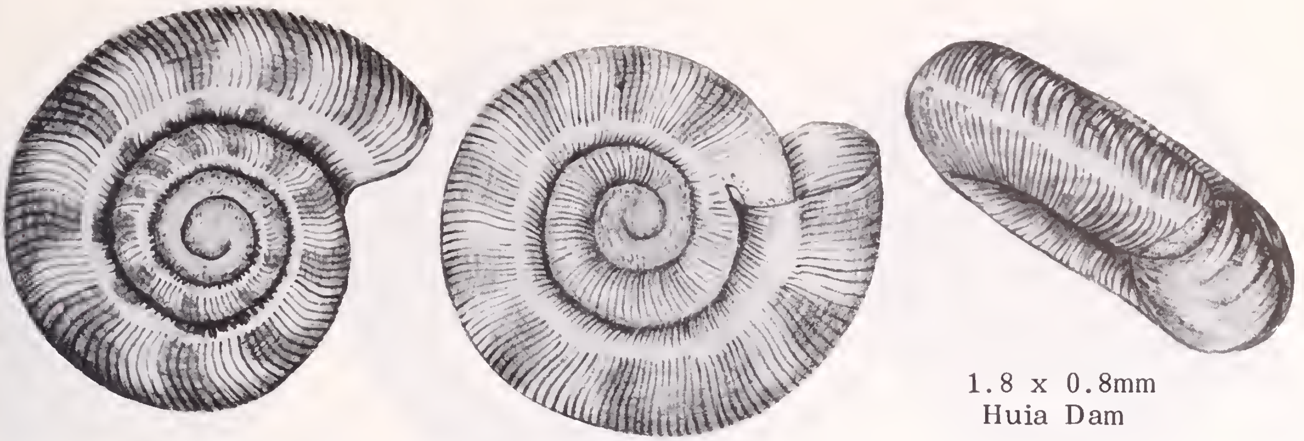
1.9 x 0.9mm Titirangi

Charopa pseudanguicula (Iredale)
A small dark shell with white radial flashes more at home under bark. I have never found it to be abundant but it lives throughout New Zealand, usually in the same sort of niche.



2.0 x 0.8mm

Charopa cf pseudanguicula (a)
Whereas the former species has a slightly raised spire, this one is flat to sunken. Otherwise the shells are remarkably similar and this one, being uncommon, could easily be overlooked.

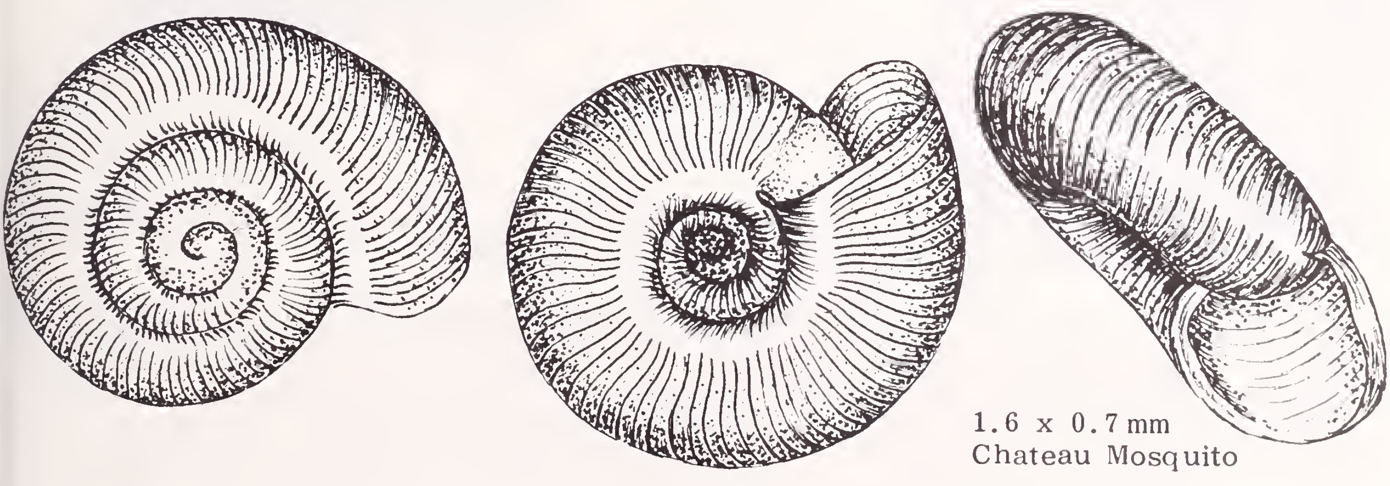


1.8 x 0.8mm
Huia Dam

<u>Charopa cf pseudanguicula</u> (b)
This is a remarkable extreme of the previous two species for the spire is quite sunken and the umbilicus extremely wide and shallow. Dr Climo has one other specimen collected near Mangamuka, Northland by P. Mayhill (1978), which he had been considering as perhaps a freak of <u>cf pseudanguicula</u> until this one turned up.

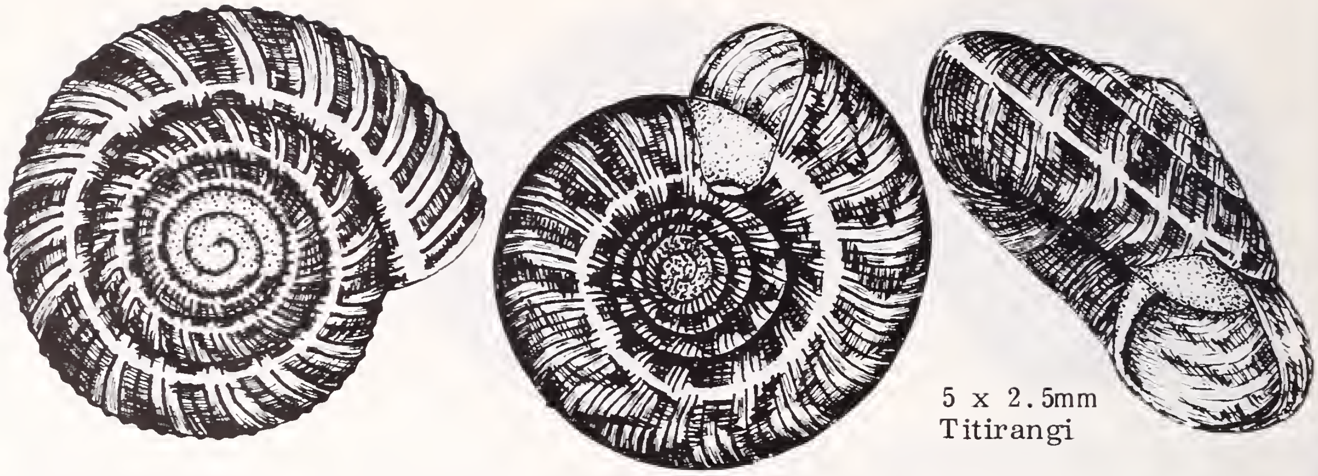
West Coast Rd
1.8 x 0.9mm

<u>Charopa chrysaugeia</u> (Webster)
A golden brown close-ribbed snail which was really not at all common. A Rimu at Fairy Falls in a damp, fairly dark situation yielded a colony with some very large snails.



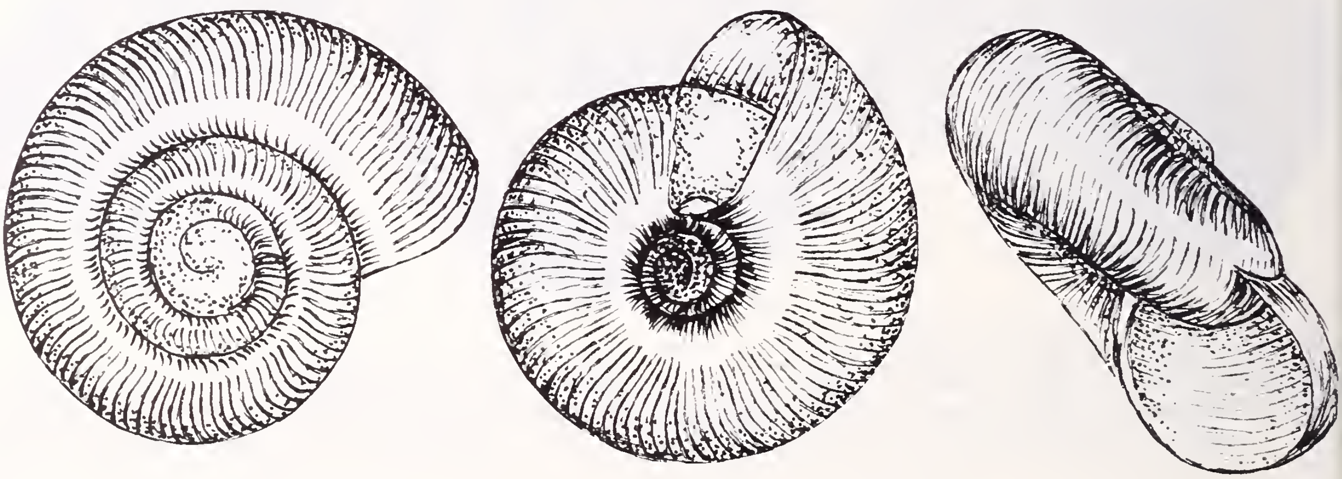
1.6 x 0.7 mm
Chateau Mosquito

<u>Charopa fuscosa</u> (Suter)
A striking reddish-brown shell found at a few sites, but again uncommon.



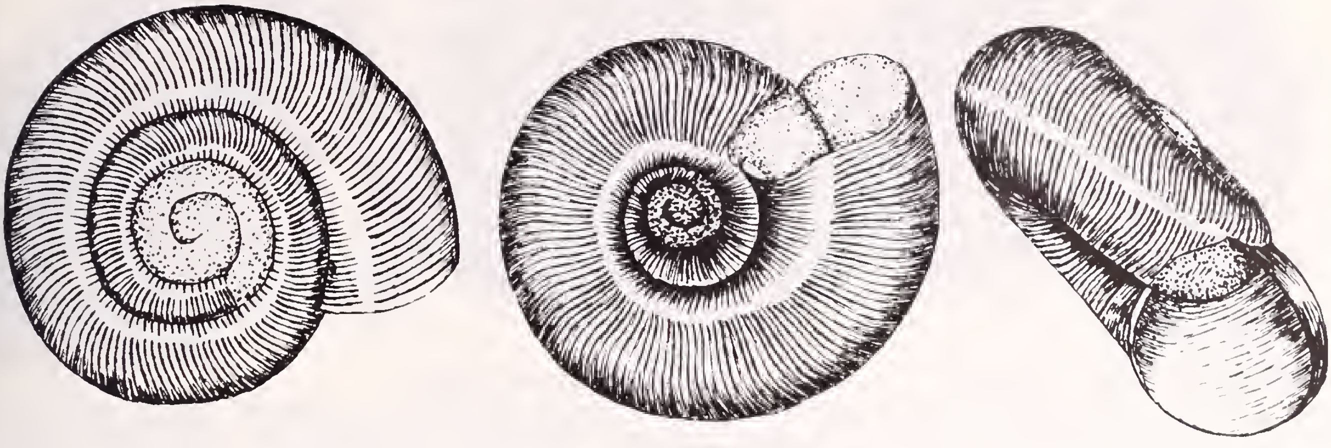
5 x 2.5mm
Titirangi

Charopa coma (Gray)
A common New Zealand snail living in places in large colonies and showing a preference for under bark on rotting logs.



Charopa ochra (Webster)
Both this and the next species are almost identical but for the width of the umbilicus. Neither is common, but ochra seems to turn up more often

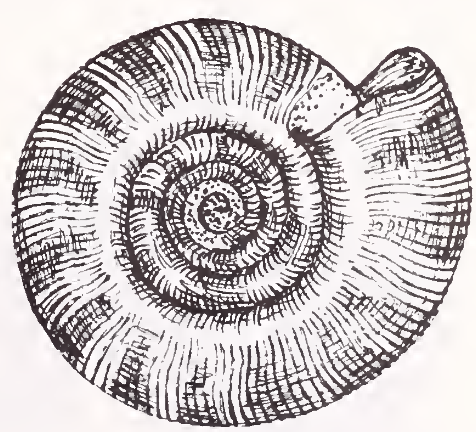
2.3 x 1.2mm Huia Ridge track



Charopa titirangiensis (Suter)
The best point of identification of these two straw-coloured snails is the very large protoconch. This one, although it carries a local name, is quite scarce.

2.4 x 1.2mm Titirangi

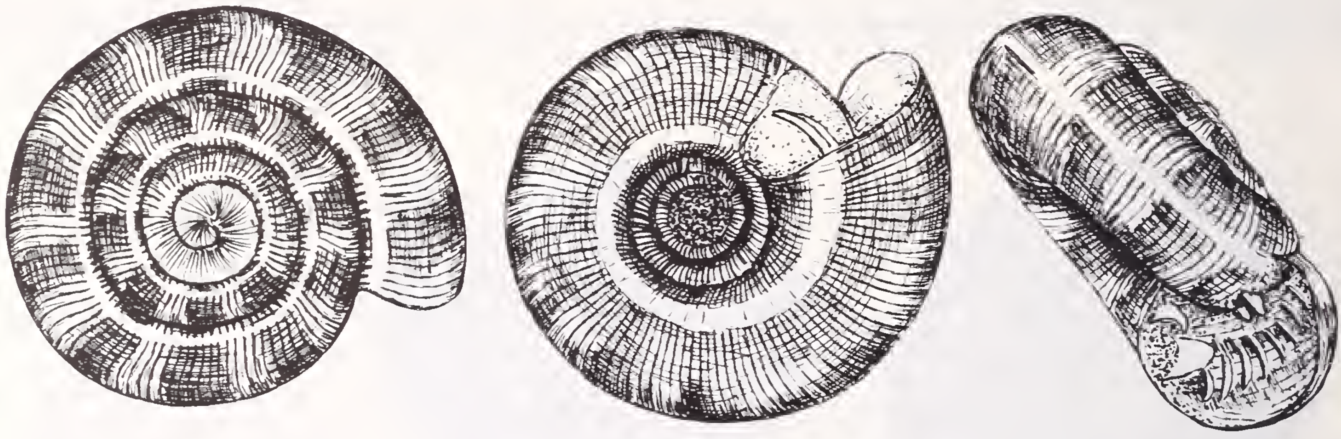
The Walkers Bush one
3 x 1.5mm



Charopa transenna (Suter)
This species has been known only from the Waitakeres,but I have also collected it from the Wairoa Dam, Hunua; also one specimen from Gt Barrier Island. It is strongly ribbed and has dark brown radial markings, though its chief characteristic is the concentric lines on the base. One specimen I have from Walkers Bush is very large and has a wider umbilicus proportionally than the rest. The one from Gt. Barrier also displays this wide umbilicus.

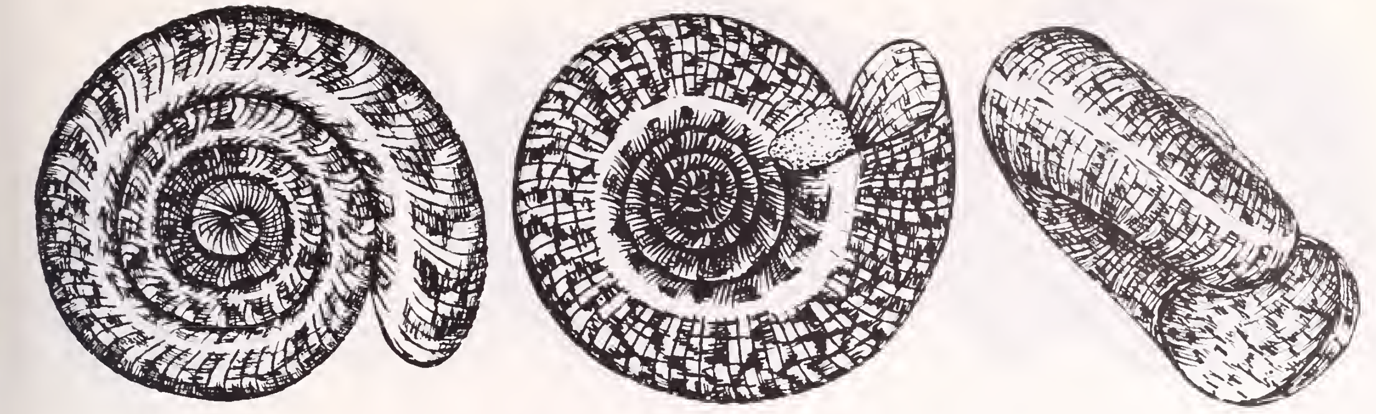
2.6 x 1.3mm West Coast Road

Charopa pilsbryi (Suter) 2.4 x 1.1mm Houghtons Bush
Another species found mostly under bark. This is a flat shell with a distinctive "perspective" umbilicus and an attractive colour pattern.

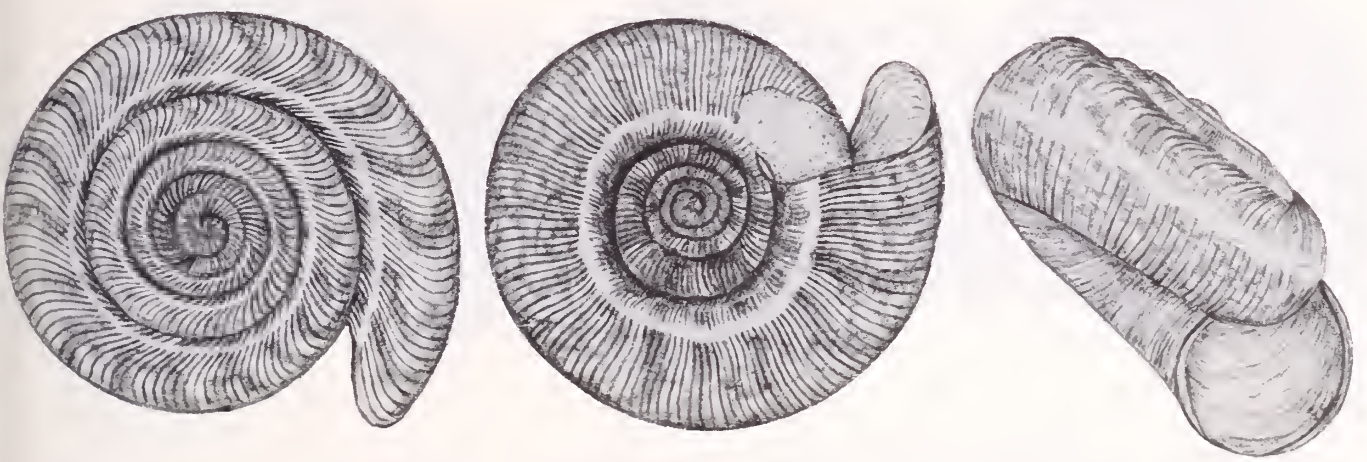


Huonodon hectori (Suter) 1.7 x 0.7mm Titirangi
A prolific species further south but not quite so numerous here. Under bark on rotting logs is its home and when the log is at just the right stage of decomposition it can be present in hundreds. A very successful snail.

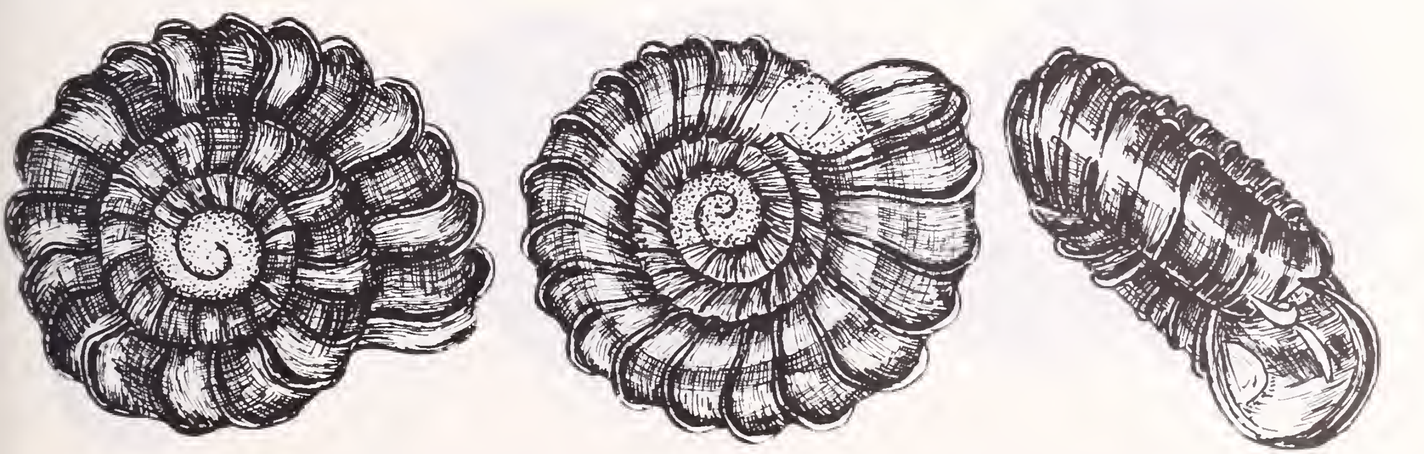
Huonodon pseudoleioda (Suter) 2.4 x 1.3mm Titirangi
Fairly common and I have often found it by itself in situations shunned by other snails. The ribs are rounded and strong, and the live shell quite shiny, glistening and solid looking. A litter dweller.



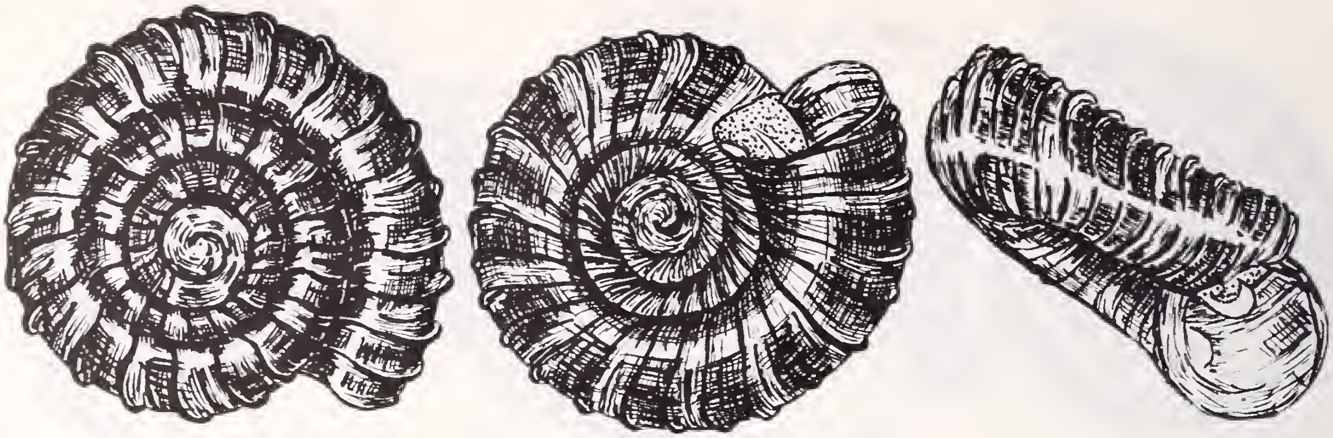
Cavellia buccinella (Reeve) 2.2 x 1.0mm Goldies Bush
A widespread prolific species which always seems to be present over the whole range from very young to old mature shells, so it must be breeding continuously. Many other species are all the same size when collected and perhaps breed at set times.



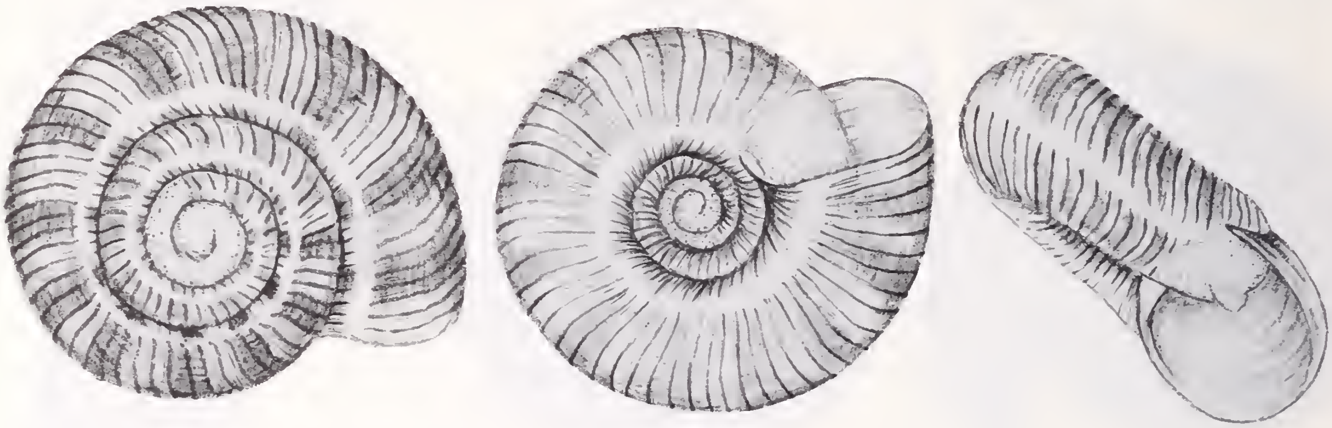
Cavellia roseveari (Suter) 4 x 2mm West Coast Road
Easily confused with buccinella in the juvenile stages but has much closer ribbing, is paler in colour and generally grows larger. It is not at all common in the Waitakeres.



Fectola infecta (Reeve) 2.5 x 1.1mm Scenic Drive
The one I drew was just young but the shell was dark and magnificent with very outstanding ribs. A mature shell would reach 4mm at least and this larger size distinguishes it from the rest of the genus.

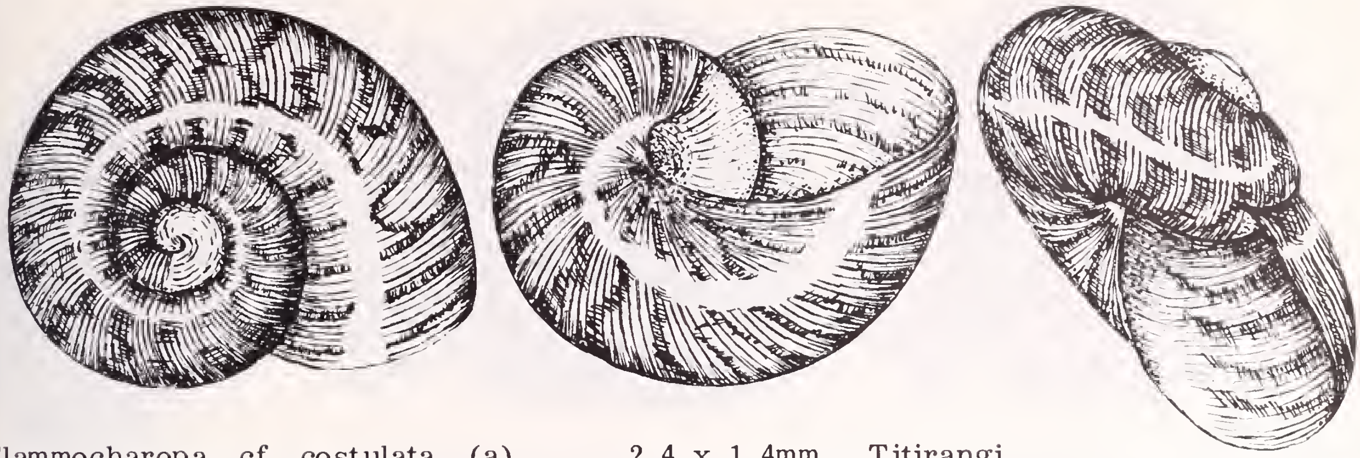


Fectola mira (Webster) 2.3 x 1.2mm Houghtons Bush
Contains a bifid parietal lamella and one at the base of the columella. The fact that I hardly found any was undoubtedly due to my sampling methods, for I think it is reasonably common.

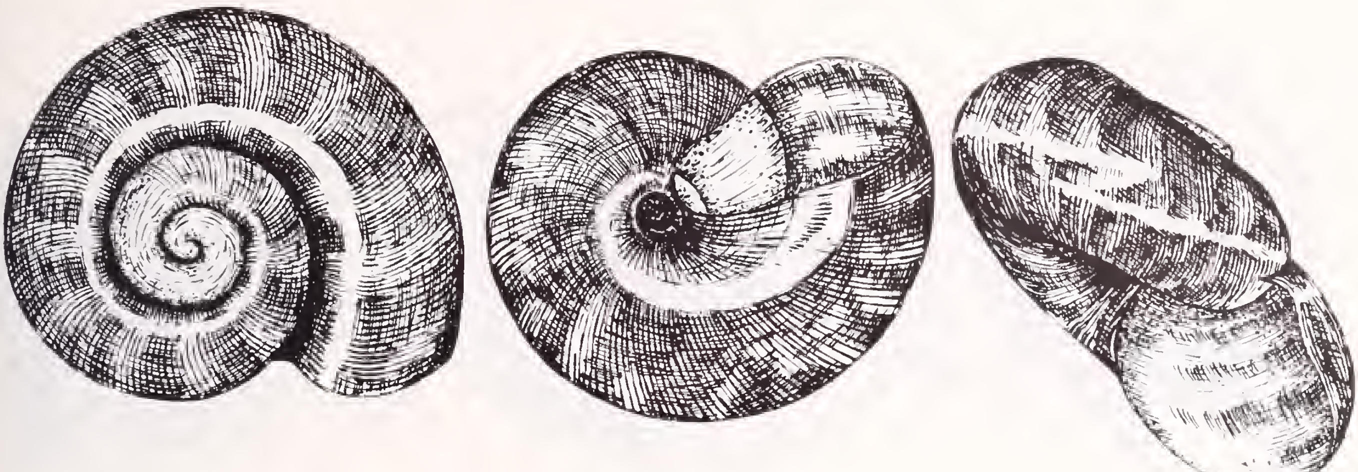


Fectola unidentata (Climo) 2.5 x 1.2mm Huia Dam
This species has not previously been collected in the Waitakeres, though Dr Climo tells me he now has records of it from as far north as Bland Bay and Poor Knights Islands.

Flammocharopa costulata (Hutton) 3 x 1.7mm Byers Track
A reasonably large shell with fine ribbing. I only found one during the whole survey.



Flammocharopa cf costulata (a) 2.4 x 1.4mm Titirangi
One of a group of little snails not yet studied or described. This one seems rare, although I also have a specimen from Hunua.

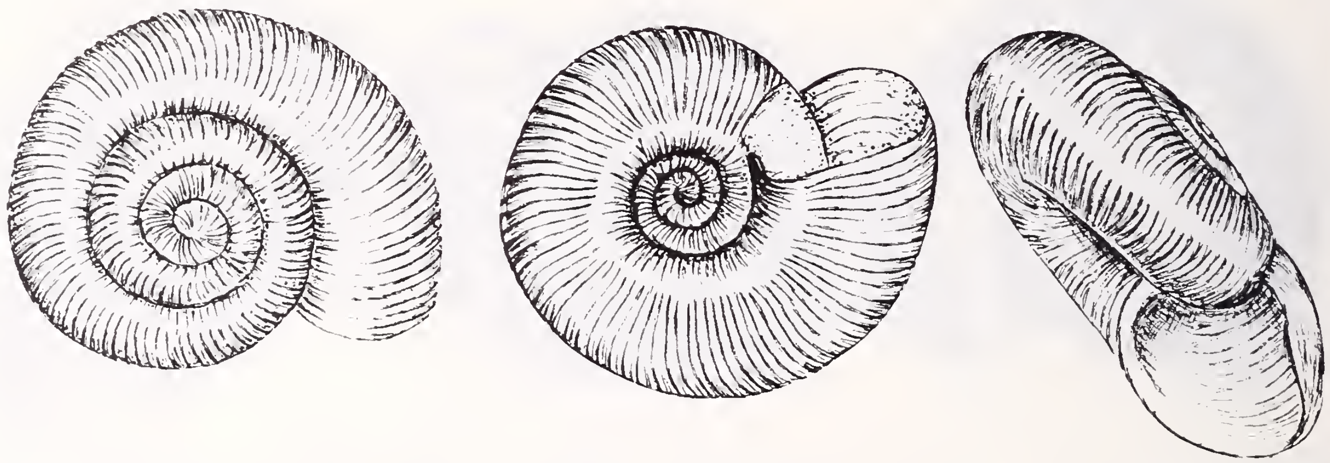


Flammocharopa cf costulata (b) 1.9 x 1.0mm Titirangi
This is a solider shell more akin to costulata. Although I have lumped these three together here, it seems unlikely that they would even be in the same genus. This one could perhaps be a juvenile.

Flammocharopa cf costulata (c) 1.8 x 0.9mm West Coast Road
This one is not so rare and I have found it at Hunua, Coromandel and even had reports of it from Birkenhead (H.Spencer). It is not unlike cf costulata (a) as regards colour and ribbing, but is chiefly distinguished by a strongly spiralled protoconch and open umbilicus.

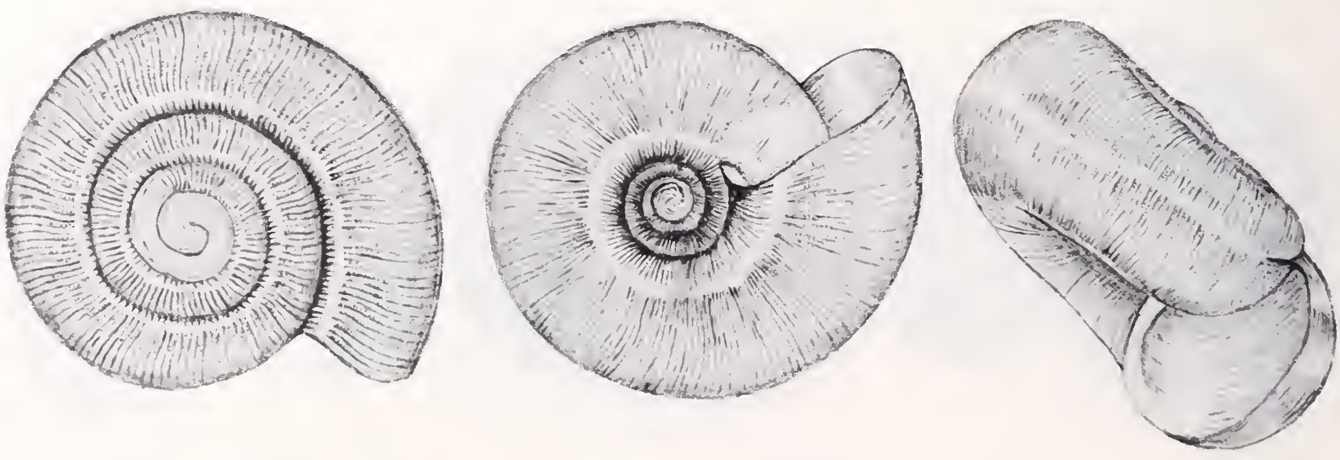
Geminoropa microrhina (Suter) 1.9 x 1.0mm Whatipu

A straw coloured snail which seems quite rare in the Waitakeres for it often prefers the sort of sites in which I collected.



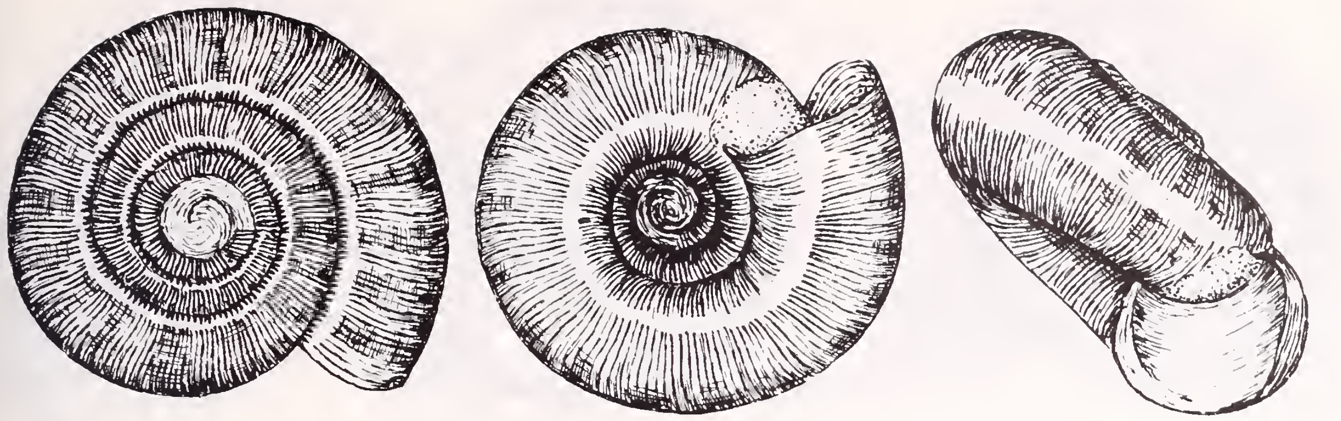
Mocella eta (Pfeiffer) 2 x 0.9mm Titirangi

This is a very successful species and occurs in very high numbers in places. Like buccinella it is always present in the full range of ages.



"Mocella" 1 2.5 x 1.5mm West Coast Road

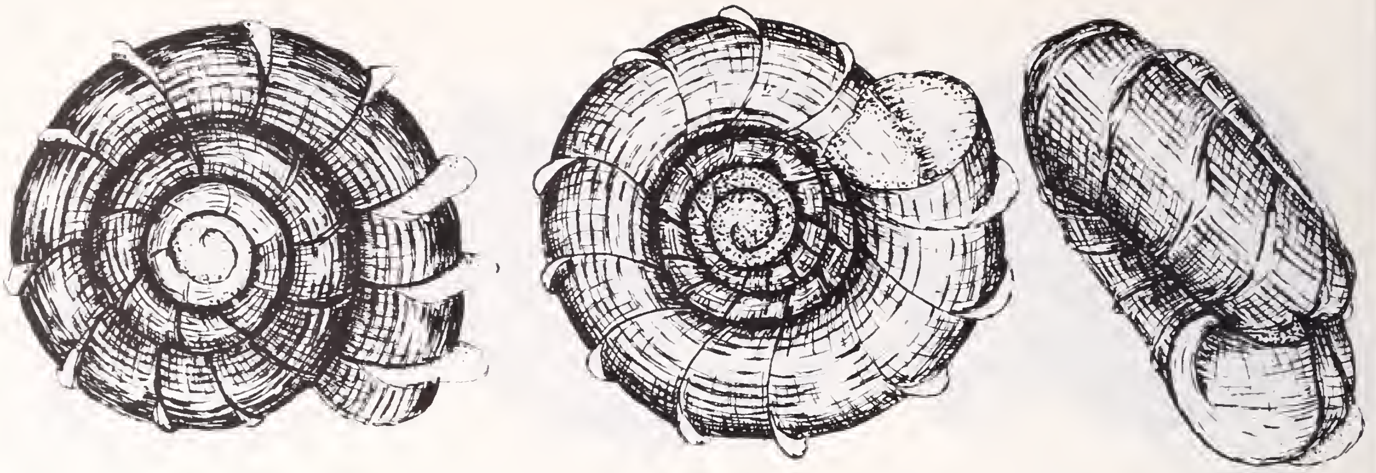
A plain brown, deep, squarish shell, tightly coiled with the smaller of the three umbilicuse. As there is no definitive work at present on this group, I have just given them numbers



"Mo cella" 3   2.5 x 1.2mm   Bethells Road
This is the most common one. It usually has a colour pattern of brown radial bands, but not always, is fairly flat and tightly coiled.

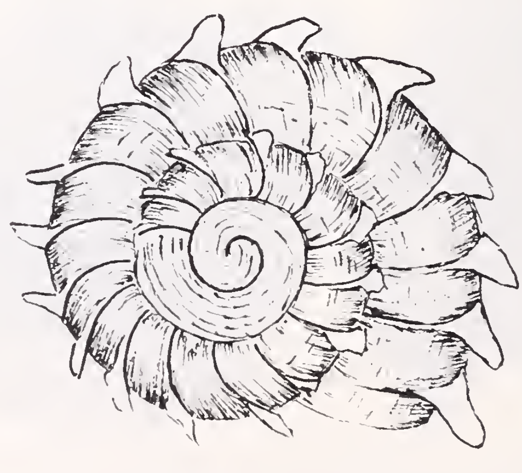
"Mocella" 4   3 x 1.5mm   Titirangi
A very finely ribbed, golden brown shell with a somewhat expanded final whorl. A little larger than the others. This can be a difficult group to separate in the juvenile stages and some workers have felt that protoconch detail holds the key.

"Mocella" 9   2.2 x 1.3mm   Huia Ridge Track - near the top
Just one odd shell which does not fit the other three groupings. It is a near white, tightly coiled shell with a small umbilicus and very close ribbing. In this group it would be foolish to read too much into single shells.

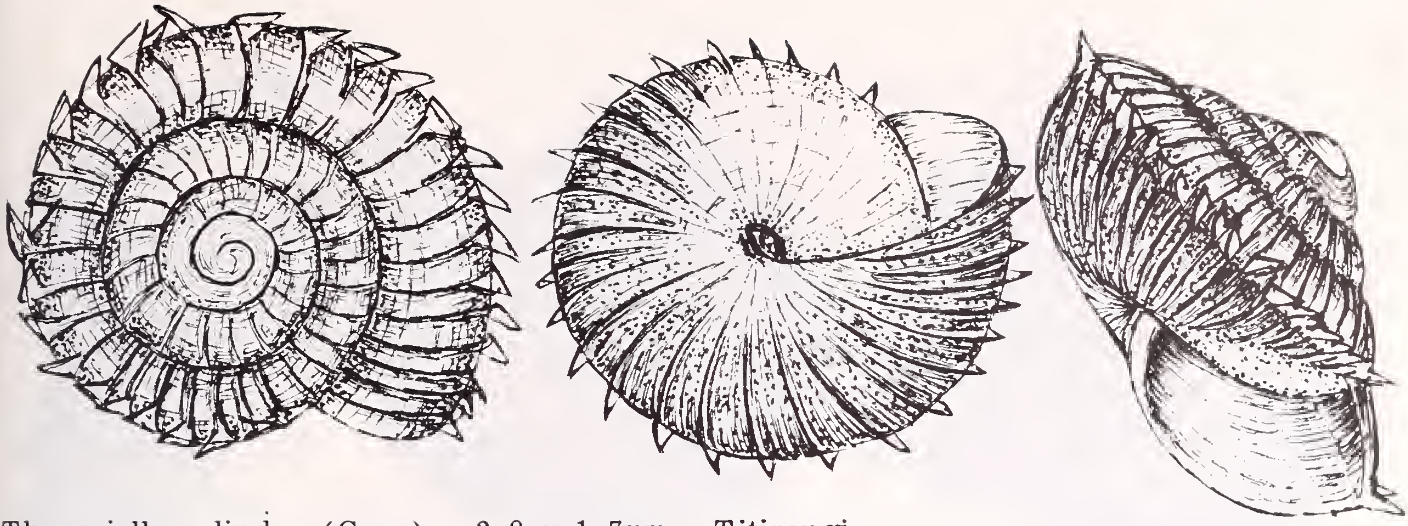


Egestula egesta (Gray) 3.1 x 1.7mm Houghtons
A striking shell which only turned up rarely and never with all its plates intact. It us
to be found on the north-east slopes of Mt Eden, in amongst the houses with large sect
of rocky bush - and it may prefer a rocky substrate.

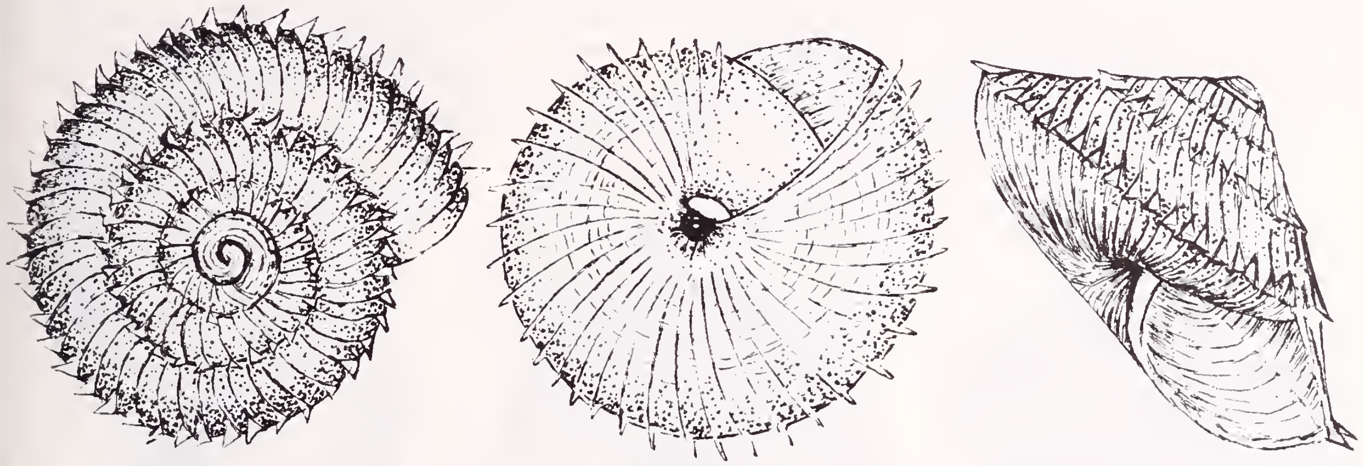
Therasiella tamora (Hutton) 3.8 x 2.8mm Whatipu
This is a very plentiful species in the Waitakeres, rivalling neozelanica, and of course more obvious because of its size. By far the majority of those I collected were without ribs or processes and I have drawn an adult in this state but included a juvenile with them all intact. The tall spire of tamora separates it from celinde if the processes are not present.



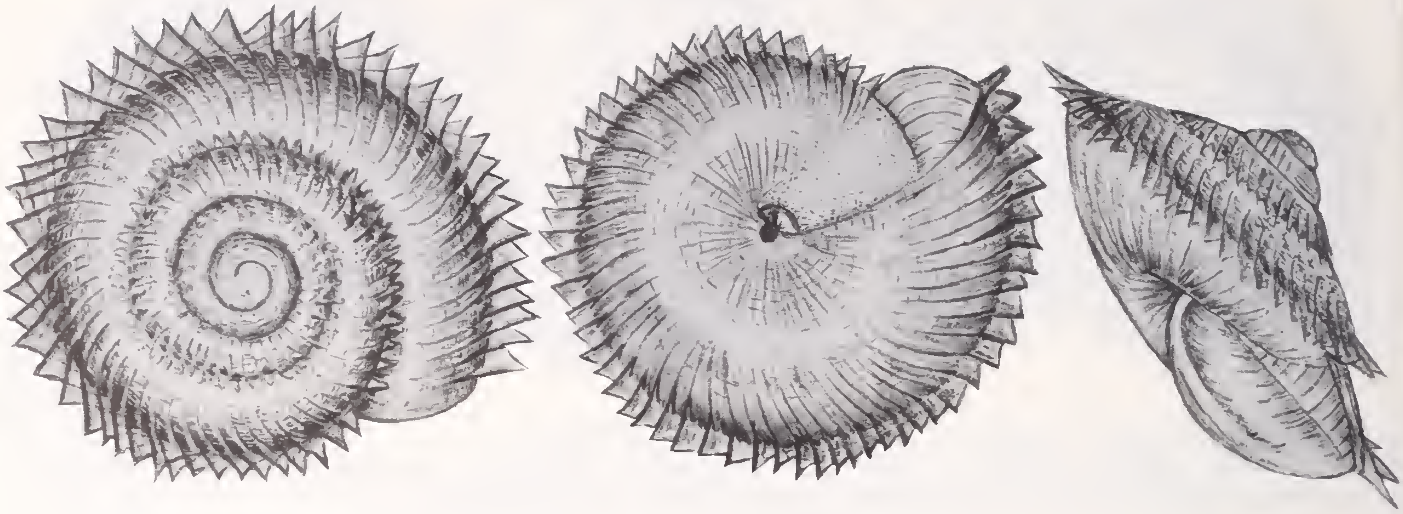
Juvenile 2.5mm across
incl. processes



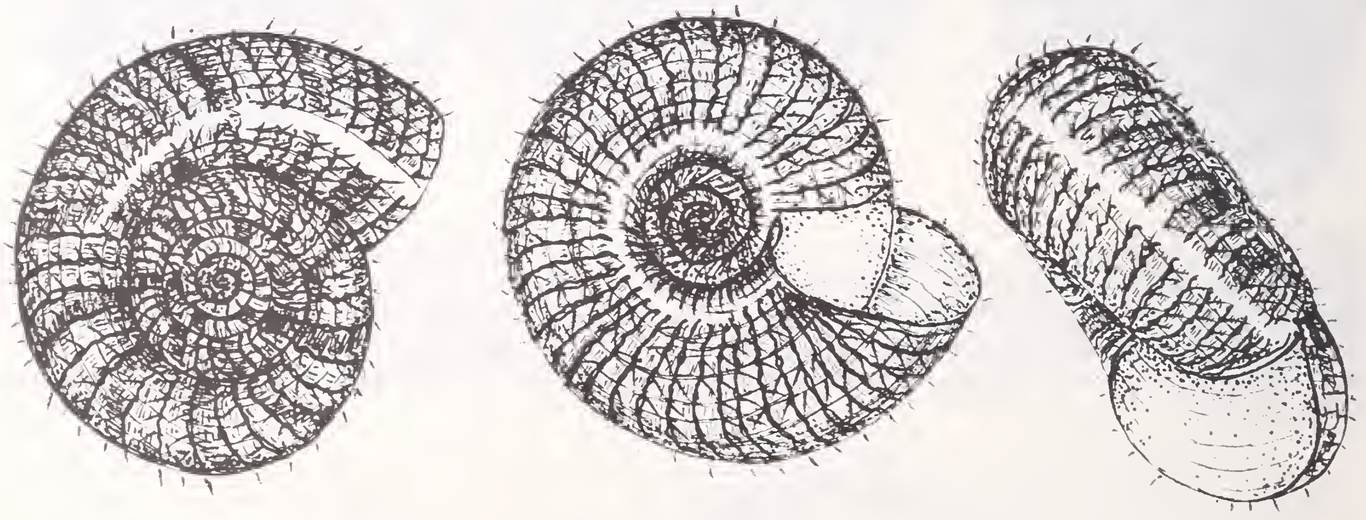
Therasiella celinde (Gray) 2.8 x 1.7mm Titirangi
Not as numerous as the other two but still fairly common. It has a lighter coloured shell than tamora and its processes are smaller and pointed.



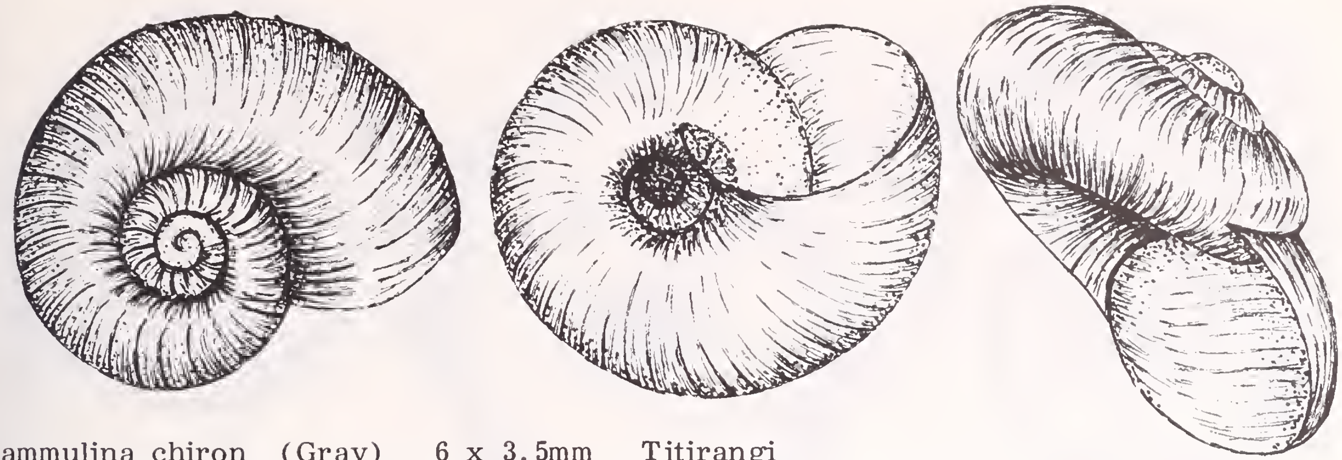
Therasiella neozelanica (Cumber) 2.4 x 1.4mm Titirangi
This is a prolific little snail,quite hardy and one which can be found in marginal situations. It has recently been divided into two species as there are obviously two distinct forms of the processes (F.M.Climo). Other distinctions are not so obvious, but this one is generally taller, lighter coloured, has a little large umbilicus but is a little smaller.



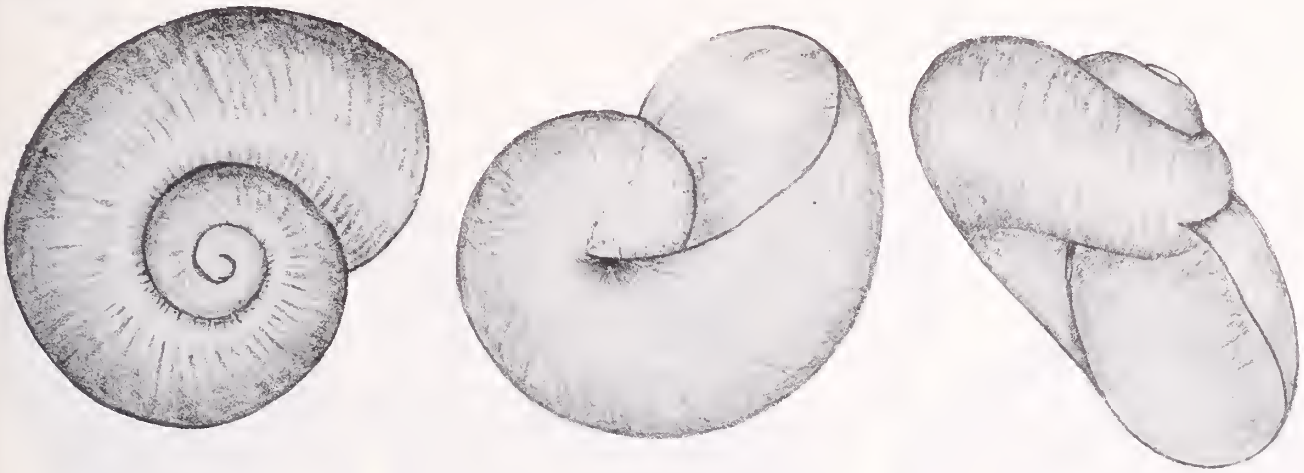
Therasiella cf neozelanica 3.5 x 1.8mm West Coast Road
This one has more the appearance of serrata which, however, does not seem to occur in the Waitakeres. Nonetheless the differences in shell characteristics have been so fine and the number collected without processes so great that I have not separated them in the lists. Suffice it to say that the two forms occur, that they are both common and with sufficient care even without the processes they could probably be separated.



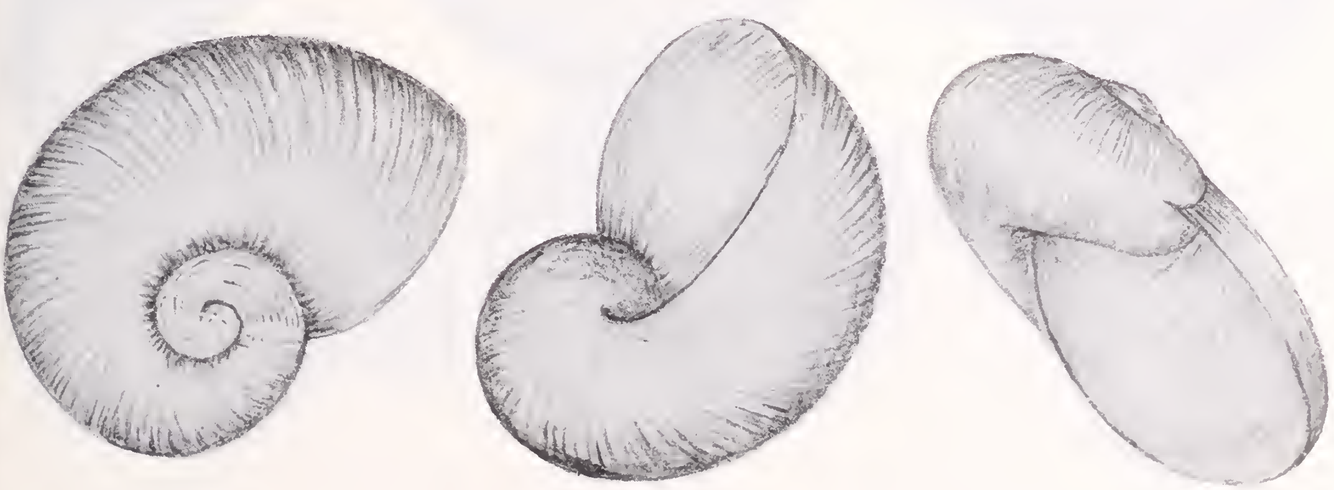
Suteria ide (Gray) 6.5 x 3.5mm Titirangi
This was not a prominent species in my sampling but it can be prolific and I have no doubt there are some high concentrations in the Waitakeres in places.



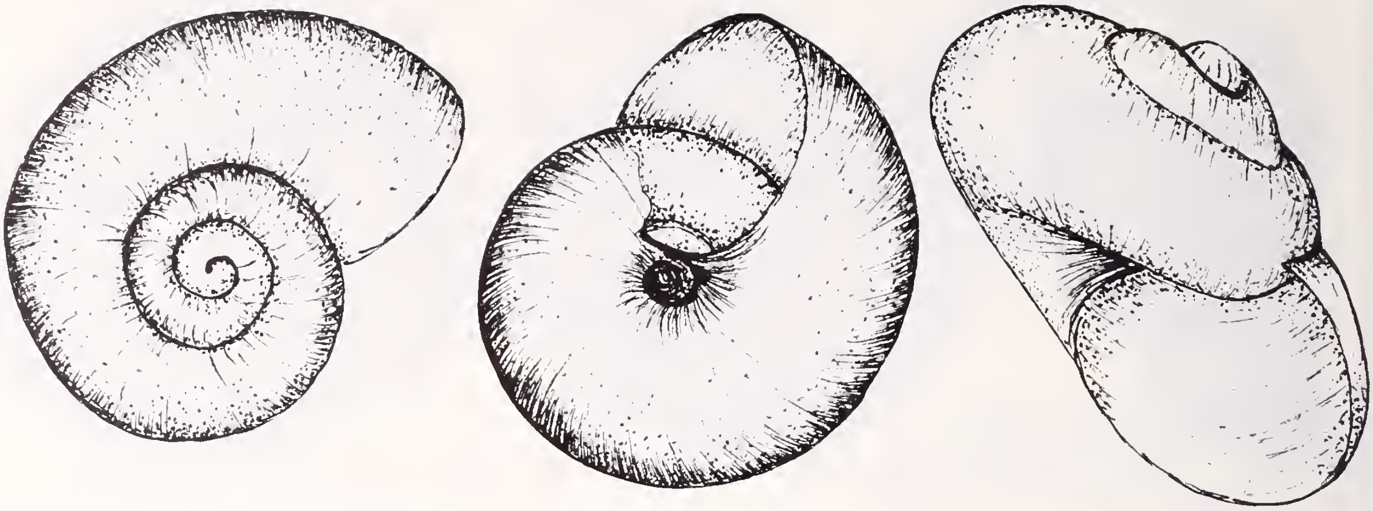
Flammulina chiron (Gray) 6 x 3.5mm Titirangi
I found only one specimen and do not believe I have ever found this snail to be plentiful. Some of these moisture-loving snails might have preferred the lowland forest which unhappily is gone.



Flammulina cornea (Hutton) 6 x 3.5mm Hunua Ranges
I have collected this snail once in the Hunua Ranges and it must be quite rare. Suter just lists its habitat as "Auckland".



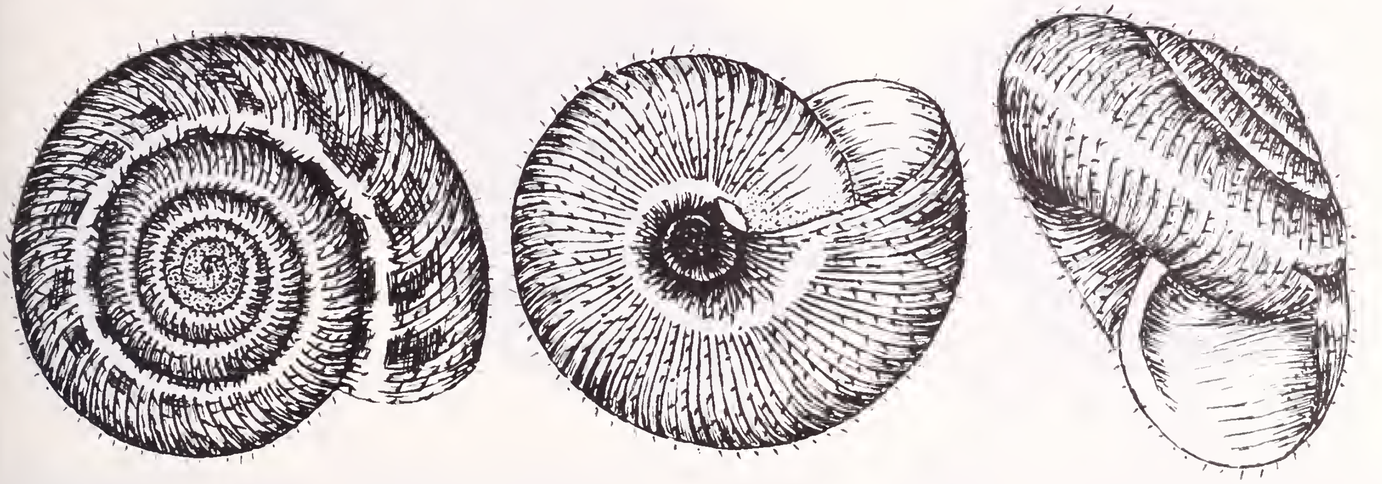
Flammulina feredayi (Suter) Coll. P.Mayhill 2.3 x 1.3mm Piha Road
I have not seen this species in the Waitakeres myself and this would be its northern limit.



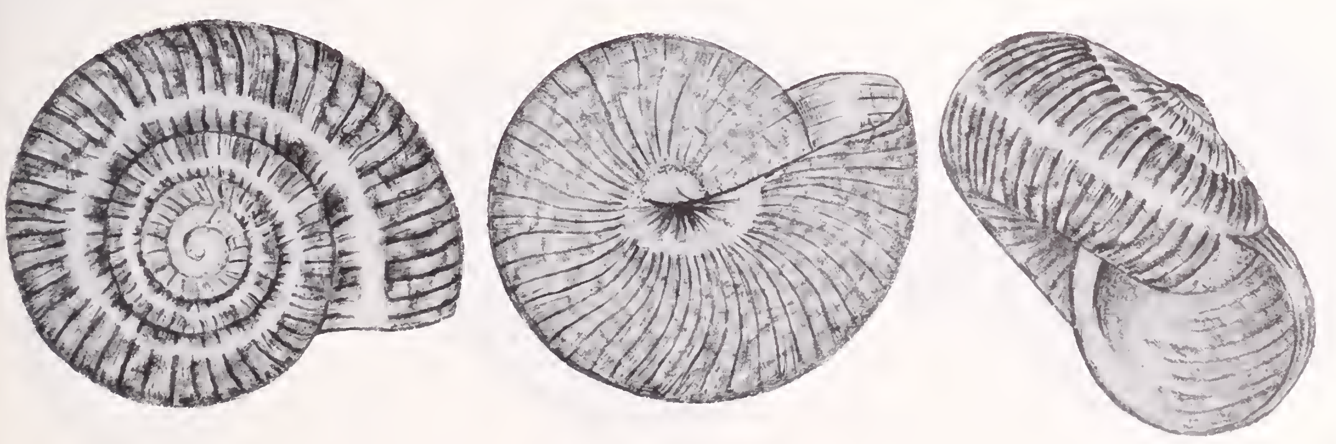
Flammulina perdita (Hutton) 5 x 3mm Titirangi
By far the most successful of the group, I have found it to be very common around the base of large Rimus. I think it must be living up the trunk under bark or on the vegetation usually clinging there.

Therasia decidua (Pfeiffer) 8 x 5.5 Rangitoto
Mentioned in "Poiriera" Volume 2 list, although I only found it myself towards the end of the survey at Huia.

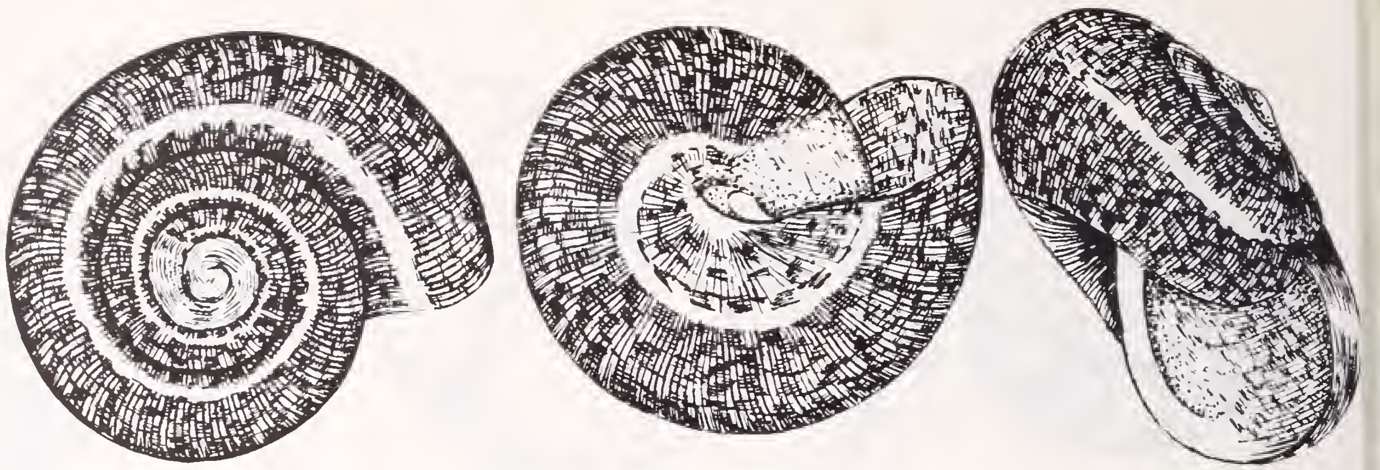
Serpho kivi (Gray) 7.5 x 5.5mm
A true arboreal snail found living on quite a range of broadleaf. When picked up from the ground, they are usually bleached white, but a fresh shell has broad brown radial bands. It is common in the Waitakeres.



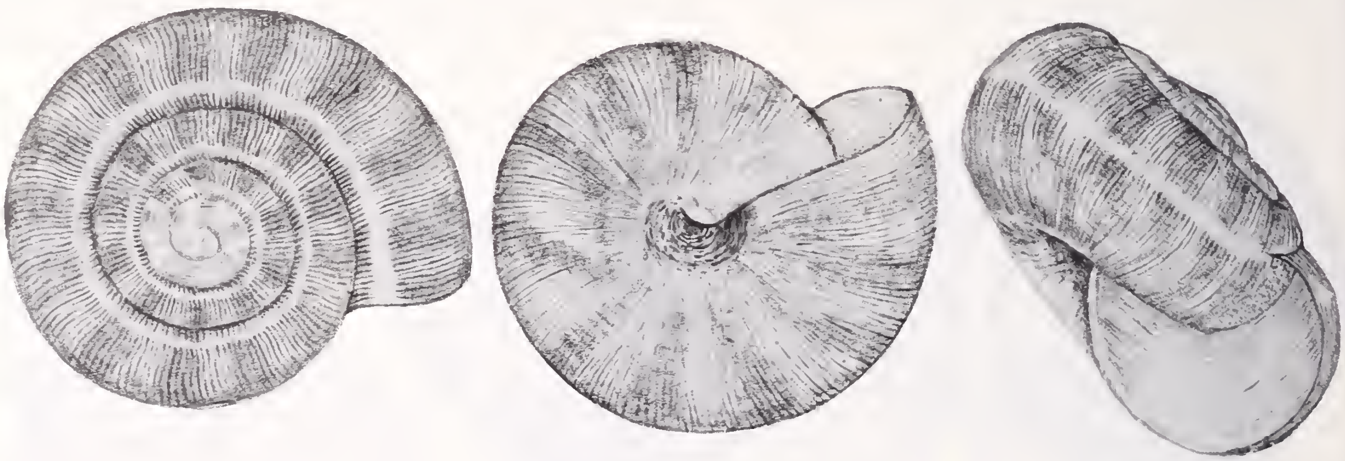
Thalassohelix ziczag (Gould) 8 x 5.5mm Houghtons
A common shell particularly in coastal situations where it grows quite large.



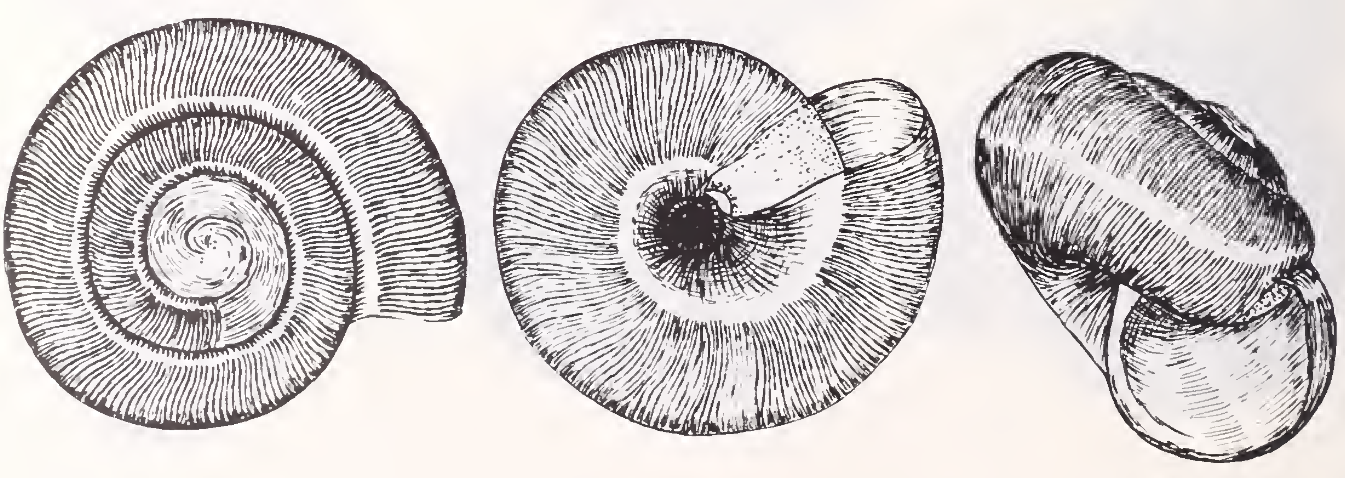
Allodiscus dimorphus (Pfeiffer) 8 x 5.5mm West Coast Road
With the sort of sampling I did on this survey it took me a long time to see this species. However, had I been collecting live specimens on the spot in litter and Nikau fronds, it would have appeared quickly for I think it is quite common.



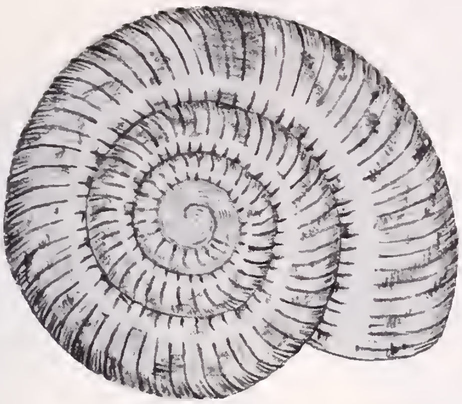
Allodiscus tesselatus (Powell) 3.8 x 1.2mm Titirangi
I only found this at one spot and I think it is rare in the Waitakeres. It is probably synonomous with A.tullia (Gray).

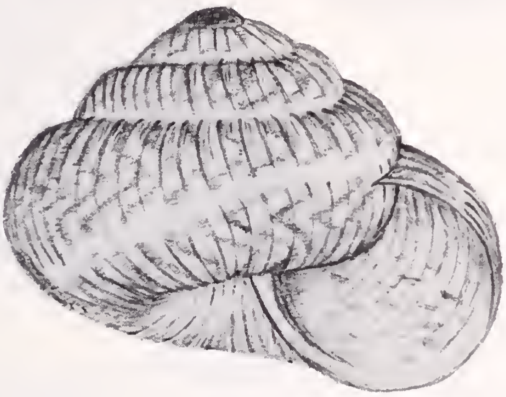


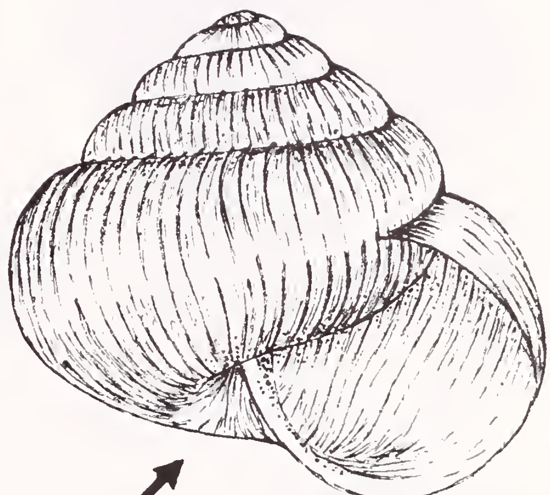
Allodiscus planulatus (Hutton) 3 x 1.7mm West Coast Road
An odd specimen kept turning up but it does not seem to be plentiful. Can easily be identified by the strong spirals surrounding the umbilical region.



Allodiscus urquharti (Suter) 1.2 x 0.7mm juvenile Bethells
This was plentiful at some spots but should have been more prominent in this sort of sampling. A plain brown shell with spiral lines on the protoconch.



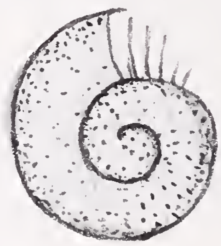




Phenacohelix pilula (Reeve) 3 x 2.5mm Whatipu
This one looks very much like a tall ponsonbyi and is widespread throughout New Zealand. However, I did not find it at all common in the Waitakeres.

Phenacohelix cf pilula 3.2 x 2.9mm Titirangi
This one, on the other hand, was very common, particularly on the southern slopes of the ranges. Golden in colour, with strong, even ribbing and secondary interstitial ribs - quite a striking shell and in appearance at least very different from pilula. I have collected it from the Manukau peninsula (Jones Bush), but I am not aware of its total range.

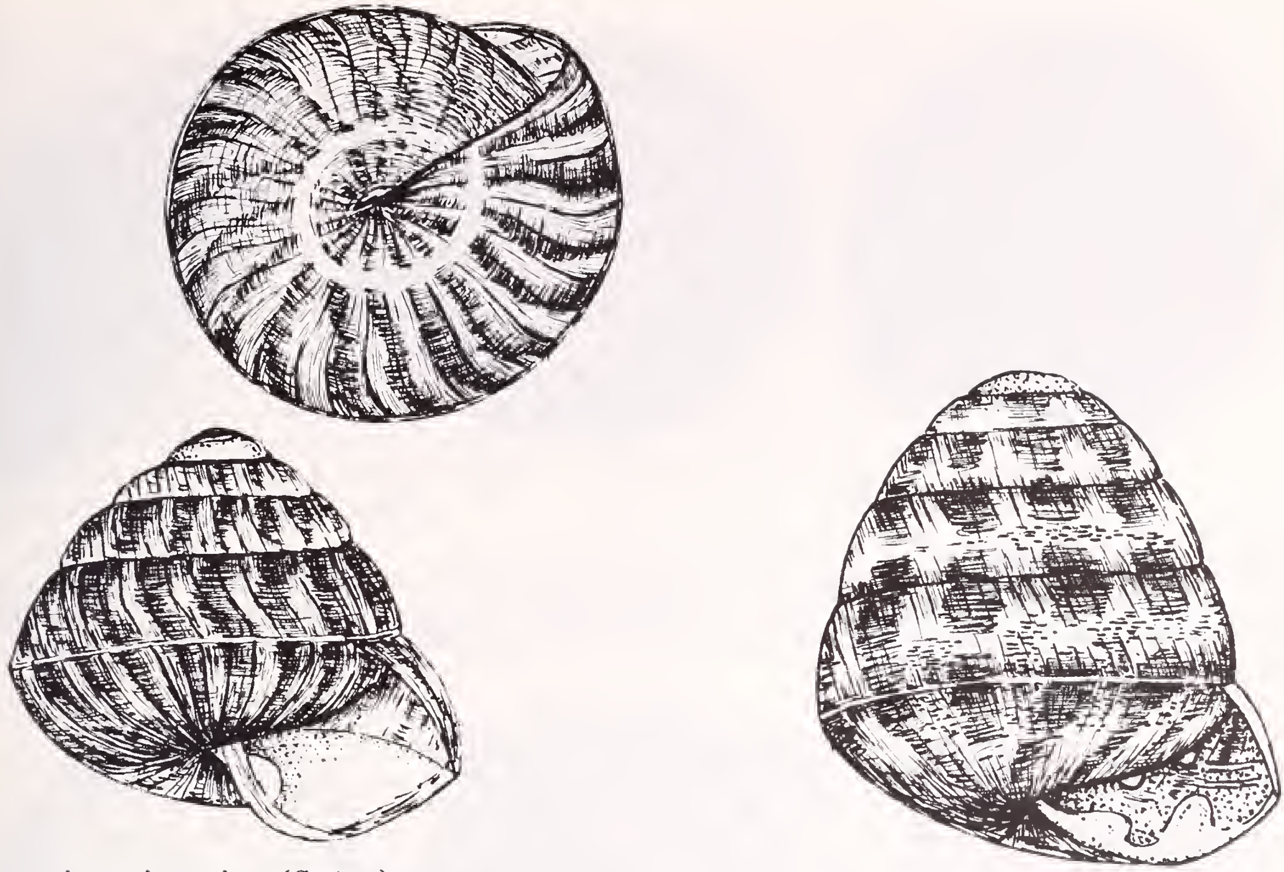
ponsonbyi



giveni

Phenacohelix ponsonbyi (Suter)
Phenacohelix giveni (Cumber) 5 x 3mm Titirangi
I have linked these together in the tables because of my inability to separate them satisfactorily. Ponsonbyi has a spiral-lined protoconch, whereas giveni has a smooth, slightly larger one. Both of these forms are present in the Waitakeres and readers should refer to Cumber's very full descriptions of the two species. I did not collect many as I refrained from looking at Nikau fronds, their favourite habitat.

Laoma leimonias (Gray) 2 x 2.5mm Titirangi
Common in places.

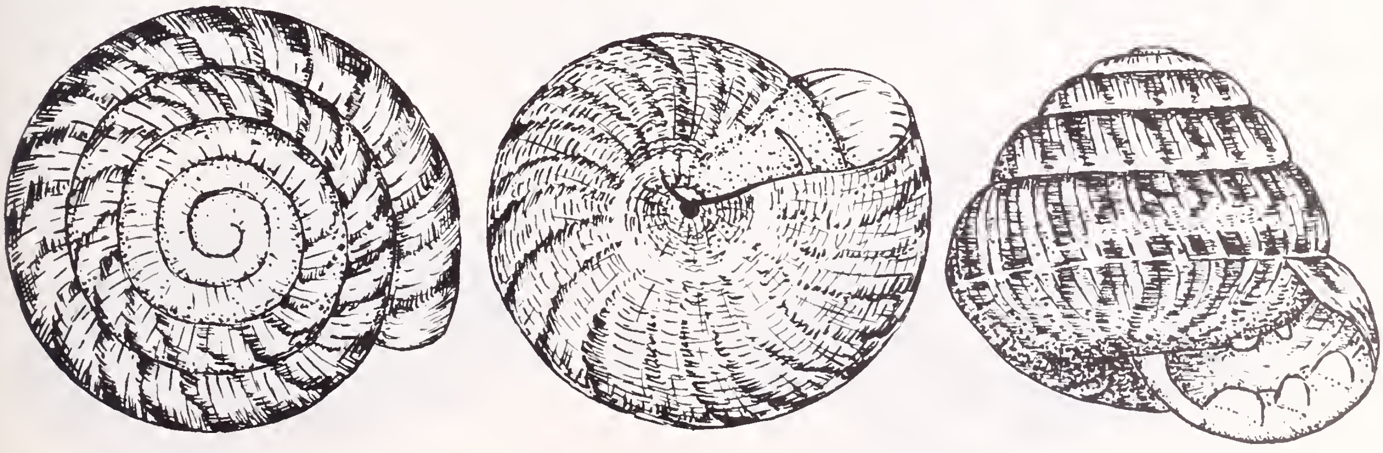


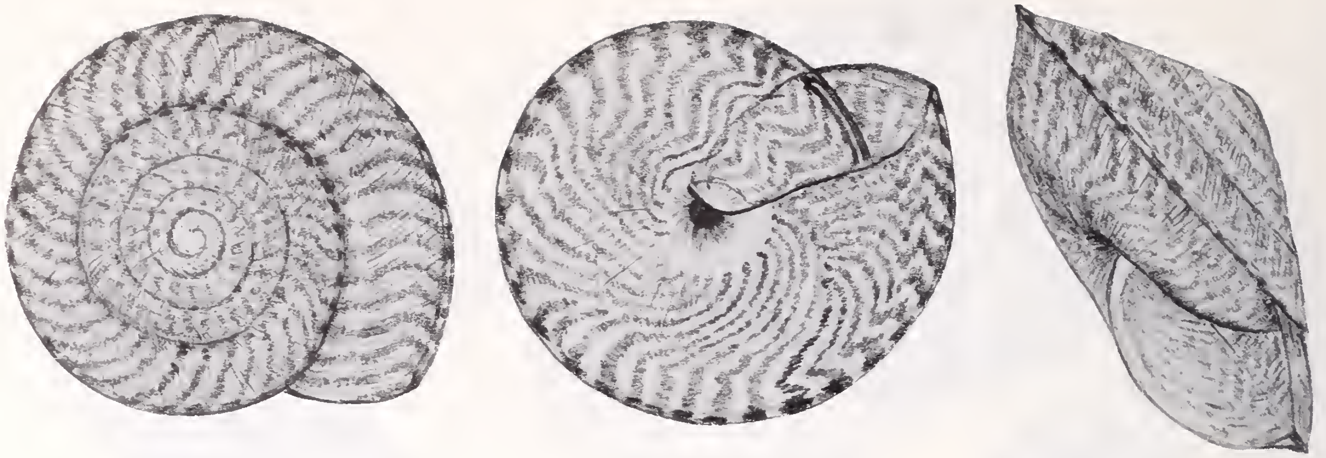
Laoma pirongiaensis (Suter)
This is very common in some places and it seemed to prefer regenerating bush where the broadleaf were just starting to push through the tall Titree. Such a spot was at Goldies Bush where it was very common. Young specimens have only the columellar lamella and only quite old shells develop the complete set. I have also drawn an exceptionally tall old shell and have seen several of these.

1.75 x 1.4mm juvenile Goldies Bush

2 x 1.99mm an old specimen from the Scenic Drive

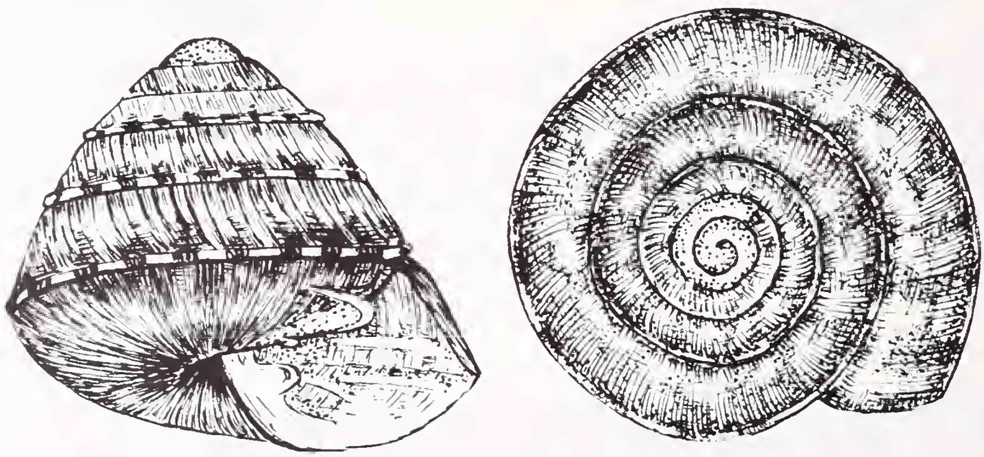
Laoma cf pirongiaensis 1.5 x 1.3mm
A much smaller, rounder shell with closer radial ribbing. This one has the same lamellae as the previous but develops them all at a very early stage. The old one of the previous species I have drawn was collected with a colony of these smaller ones on the Scenic Drive.



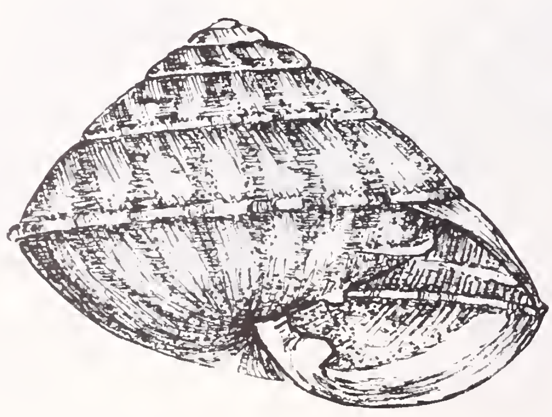


Laoma mariae (Gray) 7.5 x 4mm Whatipu
This is a little bit large to find in the sort of leaf litter samples I took and does not appear plentiful in the table. Climo suggests that it likes "slimy, wet ground surfaces under broadleaf litter", but I have found it also in large numbers in sparse bush amongst short coarse grass.

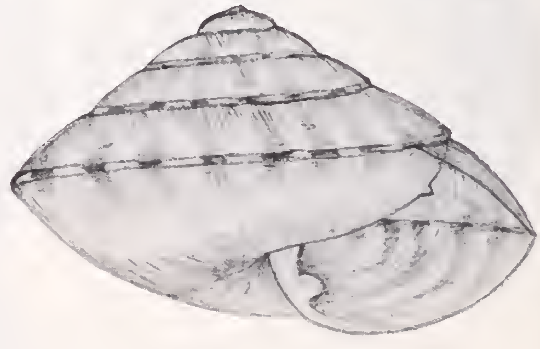
Laoma marina (Hutton) - see text, next page



3.3 x 2.4mm Titirangi

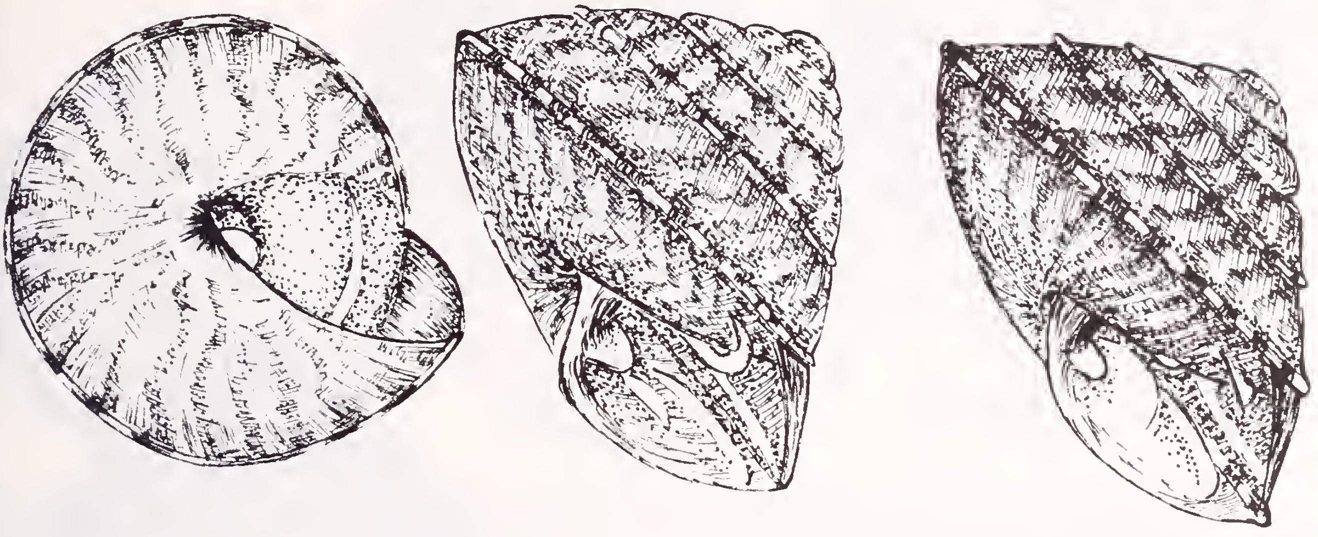


3.1 x 2.4mm Houghtons Bush



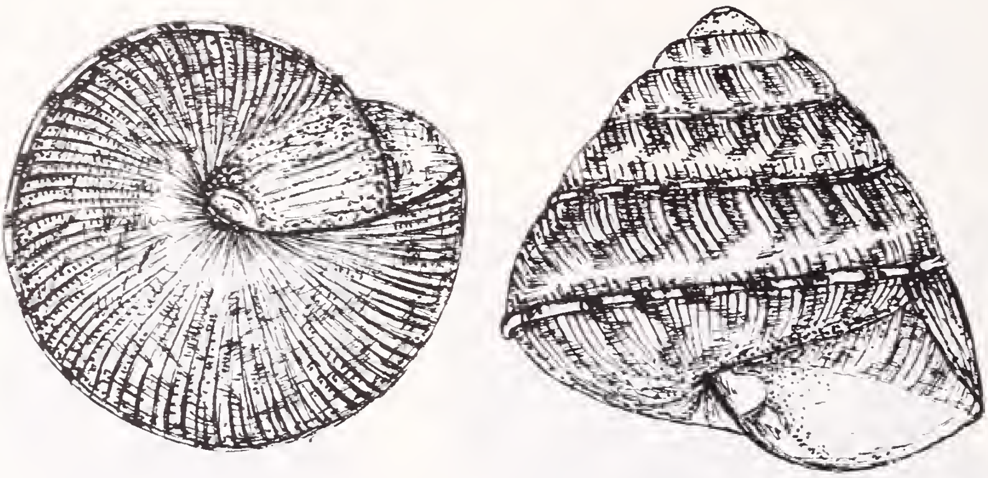
2.7 x 1.9mm Whatipu

Laoma marina (Hutton)
A whole book could be written on the variations of this species in the Waitakeres. I have spent some time grouping them and then lumping them together again. I have opted for two readily discernable groups, this one containing a lot of variable material and cf marina which is strongly carinated, costate and heavily lamellate, particularly on the bottom surface of the aperture. This is a handsome, striking shell and used to be called the "Hunua" marina. The variable group, represented by the top four illustrations, is much more lightly keeled and ribbed. In fact it can be almost smooth and does not have the corded sutures. I have not been conscious of any great shape variations other than the presence of a narrower, taller form at Houghtons Bush, but variations in lamella are great. The two basic lamellae are the one on the columella and the one two-thirds of the way up the parietal wall. Some shells from Whatipu had only these two. All sorts of other configurations were possible, though, particularly on the pallatal wall and quite often these would be replaced by just a thick white callous. However, the lamella were never as developed as those in cf marina.

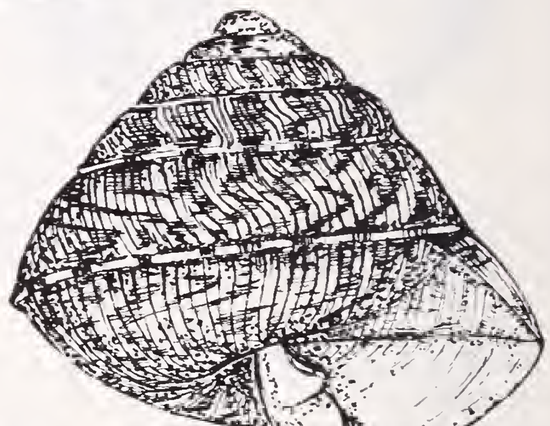


Laoma cf marina 3.0 x 2.3mm Chateau Mosquito Track 2.9 x 2.0mm Huia
By contrast this seemed a fairly constant species, though there were some variations in lamellae. This snail was abundant in the west, particularly Piha, and was less noticeable on the top of the ranges, and in the east and south. In fact I wonder if a more intensive survey might distinguish a definite boundary for this snail.

Laoma poecilostica (Pfeiffer)
This species also showed a lot of variations but on the whole did not seem to be quite as prolific as marina. It could always be distinguished by the strong ribbing. Unlike marina, the shape of the shell showed a fair bit of change but the lamellae were fairly constant. The large columellar one is fairly obvious but a fine one at the extreme top of the parietal wall is also fairly constant. Bits of lamella can occur almost anywhere and extensive callousing is quite common, but neither effect is really marked. As far as shell shape goes, I tried very hard to get a tall and a flat grouping but could find no line of demarcation. Tradition has it that conicula does not occur in the Waitakeres but only further north, and this would seem to be the case. I noticed some very "odd specimens but in the finish "lumped" everything together.



2.8 x 2.8mm Titirangi

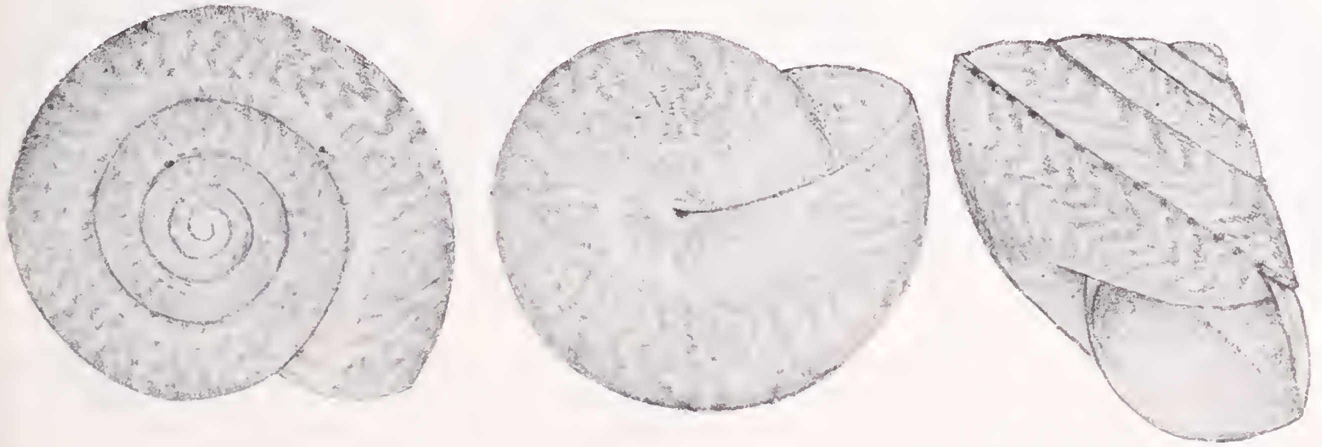


3.6 x 3.0mm Walkers Bus

3 x 2.4mm Titirangi

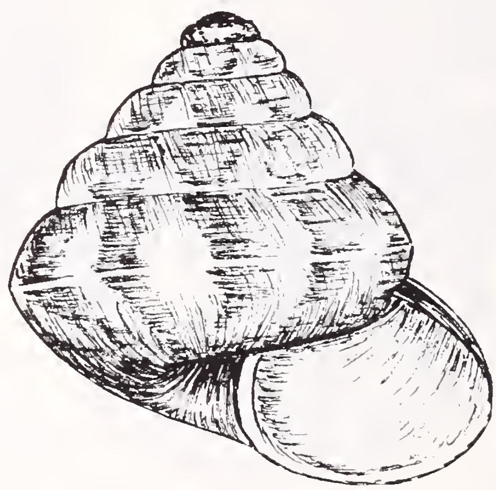
Laoma cf poecilostica
This was quite a distinct species and could not be mistaken for poecilostica. It was only lightly angled on the body whorl and lightly ribbed, though the ribbing had a slightly poecilostica look about it. The columellar lamella was really just a swelling, and it had no others. I found it at a number of stations, so it is not uncommon.

Phrixgnathus ariel (Hutton) 2.7 x 1.8mm Bethells
Not a prolific species in the Waitakeres as it can be further south. It is best distinguished by its strong rounded radial ribs and almost straight bands of brown radiating from the umbilicus at the base .

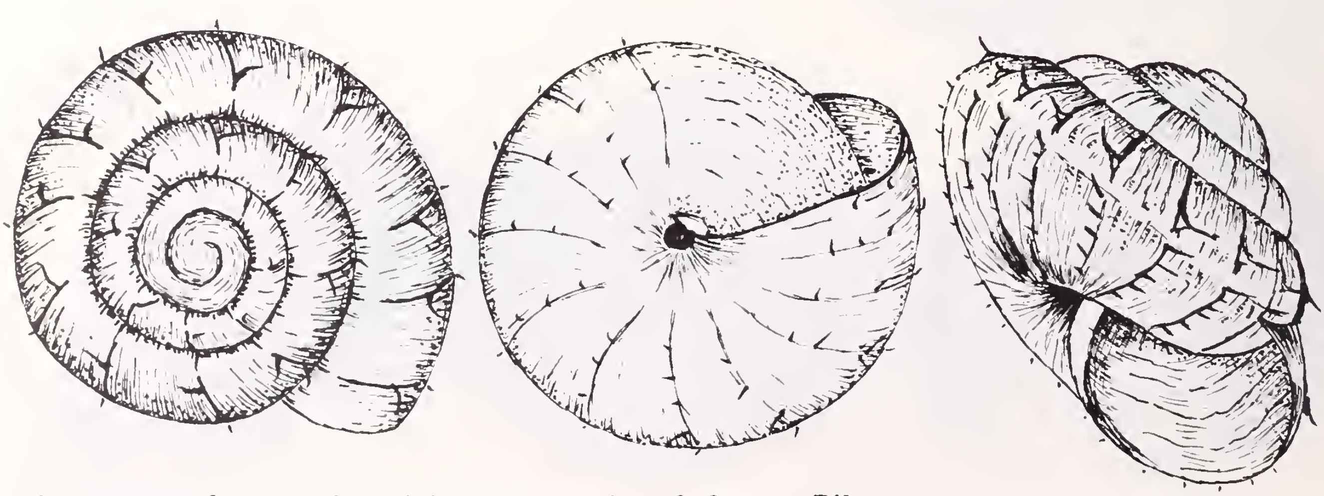


Phrixgnathus cheesemani (Suter) 4 x 2.8mm Great Barrier Island
I nearly missed seeing this species at all and drew one from Great Barrier. However, I finally found one specimen at Huia.

Phrixgnathus conella (Pfeiffer) 2.7 x 1.7mm Walkers Bush
One of the great difficulties in the Waitakeres is separating conella from fulguratus, particularly older specimens. Conella has an even shell surface with extremely close fine radial riblets. The shell surface is silky and shining, the colour markings are lightish brown (as opposed to fulguratus which has darker brown markings).

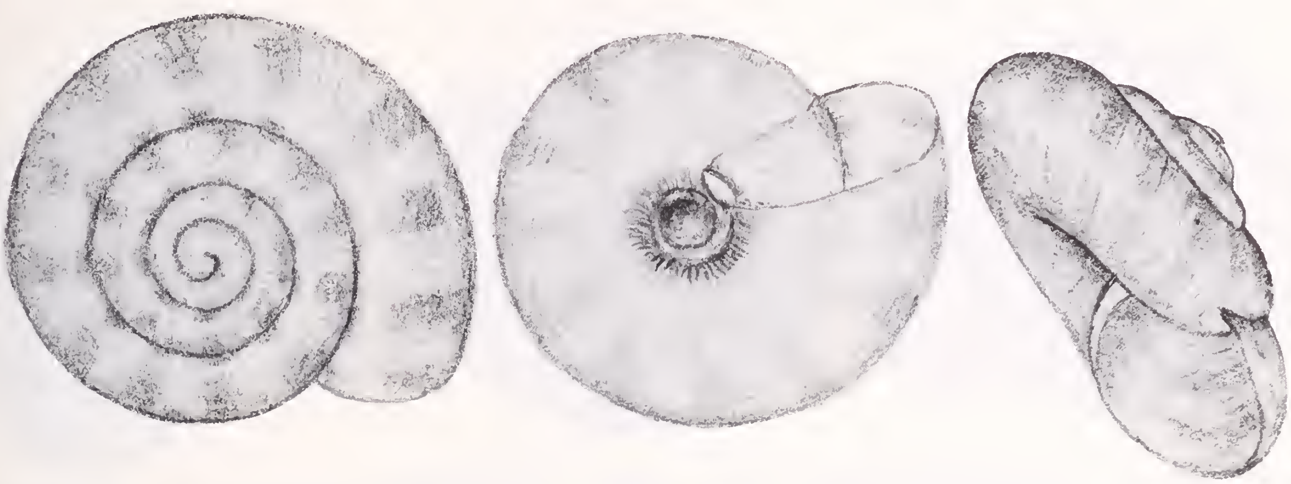


Phrixgnathus erigone (Gray) 1.8 x 1.8mm Titirangi
In my collecting the commonest snail in the Waitakeres. It was a rare leaf litter sample that did not produce one.

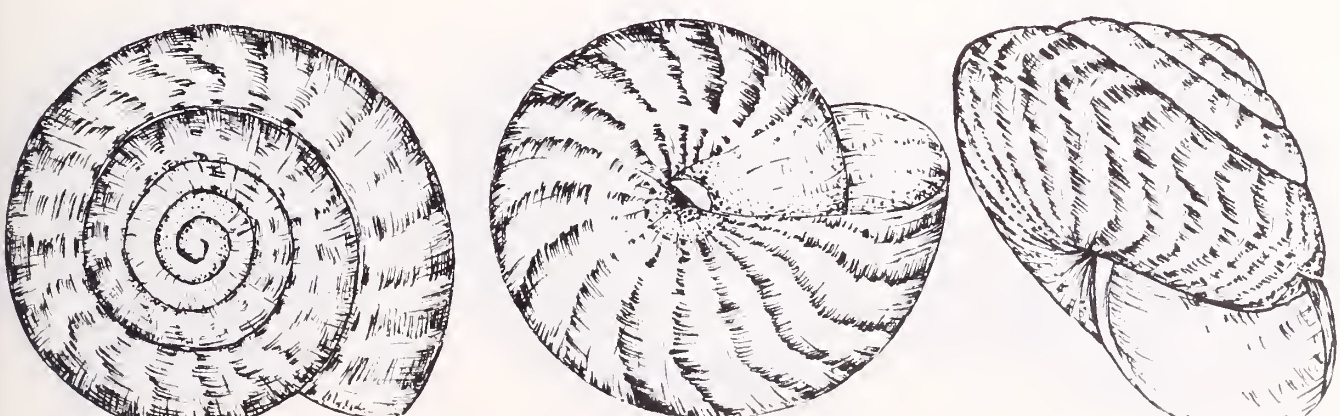


Phrixgnathus francesci (Webster) 1.2 x 0.8mm Piha
I do not think this has been collected before in the Waitakeres, but it seemed reasonably plentiful in the location in which I found it.

Phrixgnathus fulguratus (Suter) 3 x 2mm Titirangi
A duller, more uneven shell surface than conella, but still vestiges of the fine crowded ribbing so prominent in that shell.

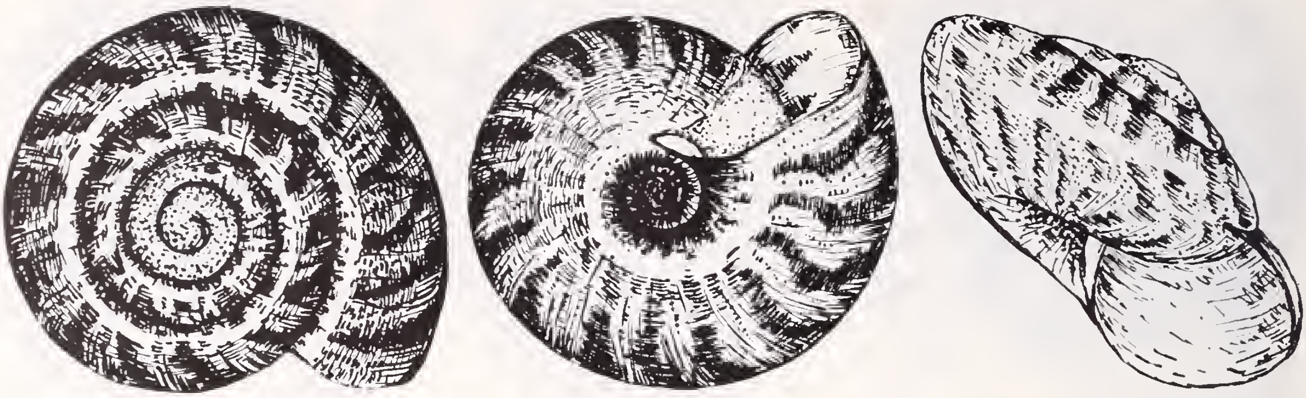


Phrixgnathus glabriusculus (Pfeiffer) 2.8 x 1.4mm Piha
In the type of samples I was taking not all that common, but in can be prolific, particularly in marginal situations.



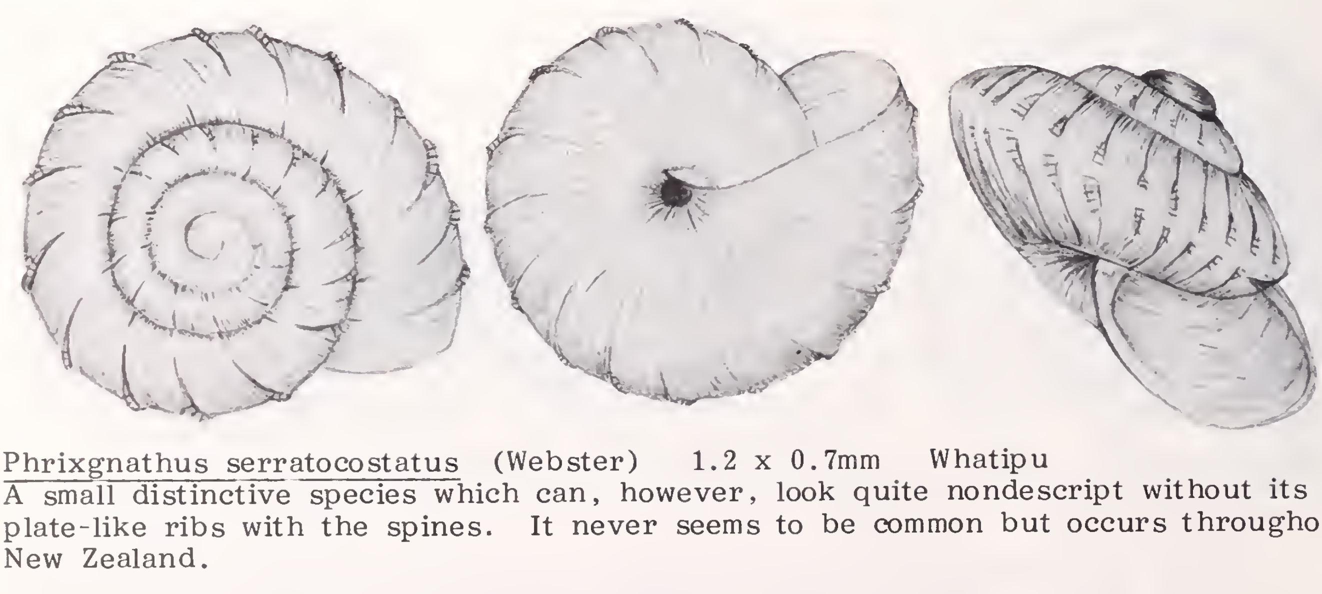
Phrixgnathus lucidus (Suter) 2.5 x 1.7mm Goldies Bush
A variable species which sometimes displayed a beautiful colour pattern on the shell and sometimes had none.

(NOTE : lucidus - glabriusculus. I have retained the old nomenclature for continuity. Dr Climo who has studied the type specimens now names them as follows: lucidus = glabriusculus; glabriusculus has no name but is just designated Punctid sp. 59 in the meantime)



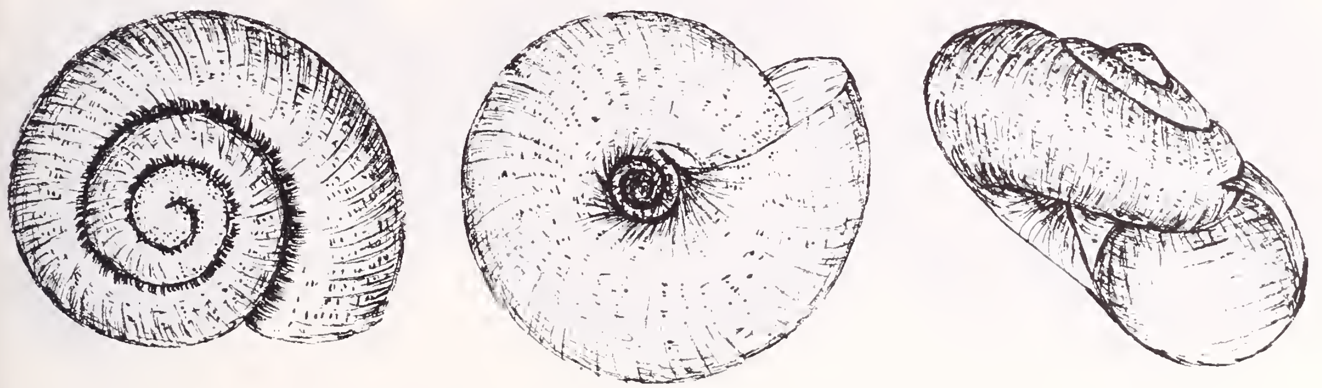
Phrixgnathus moellendorffi (Suter) 2.8 x 1.5mm Whatipu
This species can best be identified by its strong spiral sculpture. It was liable to appear in any situation, but seemed to prefer a coastal one.

Phrixgnathus cf moellendorffi 2.5 x 1.8mm Huia Dam
A taller shell with even brown radial markings and distinctive fine spiral sculpture. Dr Climo has not seen it before and it must be a new species with very local distribution.

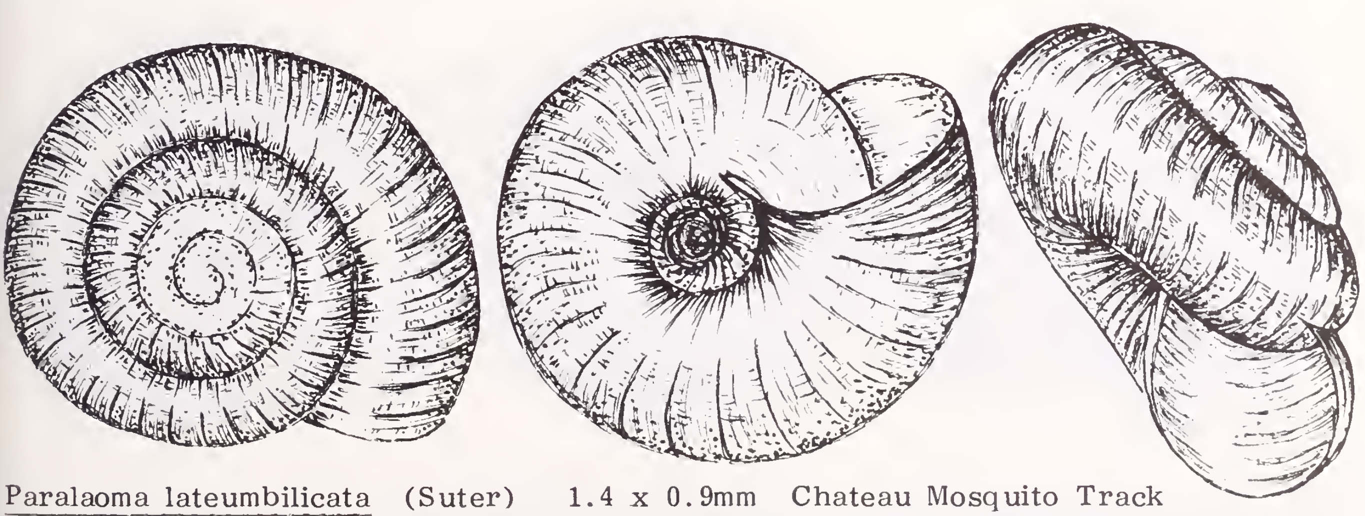


Phrixgnathus serratocostatus (Webster) 1.2 x 0.7mm Whatipu
A small distinctive species which can, however, look quite nondescript without its plate-like ribs with the spines. It never seems to be common but occurs throughout New Zealand.

Phrixgnathus viridulus (Suter) 2.0 x 1.3mm West Coast Road
Another widespread species which never seems to be common, in fact I only found one on this survey. I have a feeling it likes a rather damp habitat.



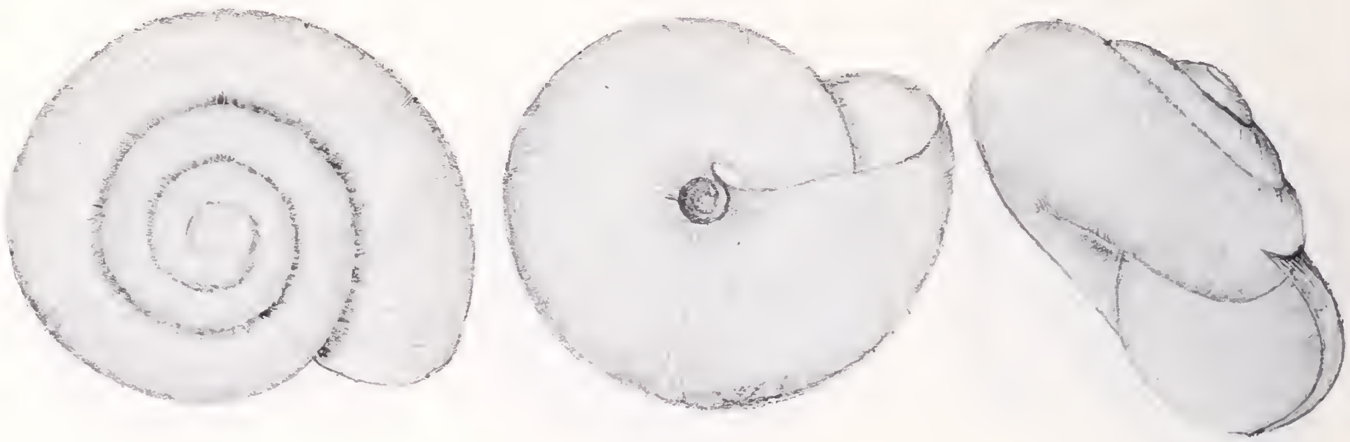
Pasmaditta jungermanniae (Petterd) 1.6 x 0.9mm Titirkangi rather juvenile
A rather plain, featureless shell which does not turn up often in the Waitakeres and invariably takes some time to identify.



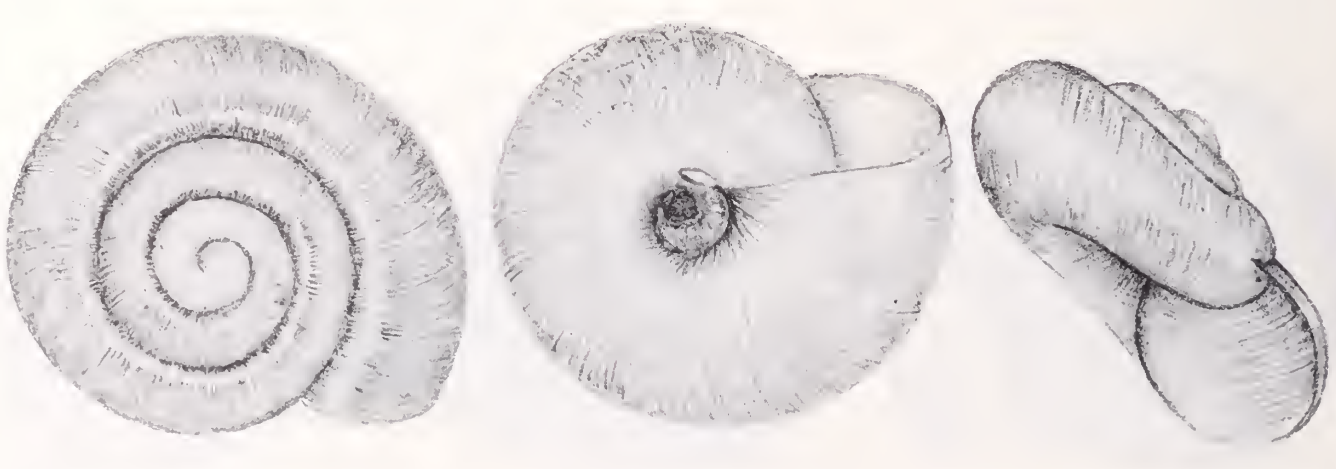
Paralaoma lateumbilicata (Suter) 1.4 x 0.9mm Chateau Mosquito Track
A prolific species which did not turn up often in my type of samples.
"Wide umbilicus" aptly describes this species.

Paralaoma caputspinulae (Reeve) 2.0 x 1.1mm Ihuamata
Mangere

I never collected this snail, neither have I seen any record of it in the Waitakeres, but it is undoubtedly there somewhere, probably around the Manukau coastline.



1.3 x 0.7mm West Coast Road

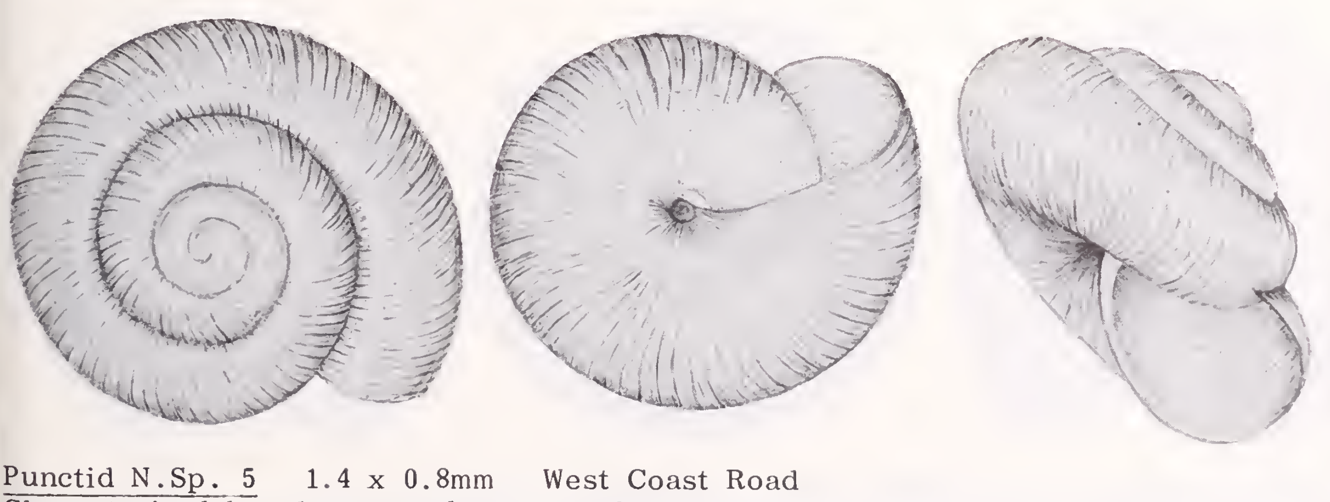


Paralaoma miserabilis (Iredale) 1.4 x 0.7mm Titirangi

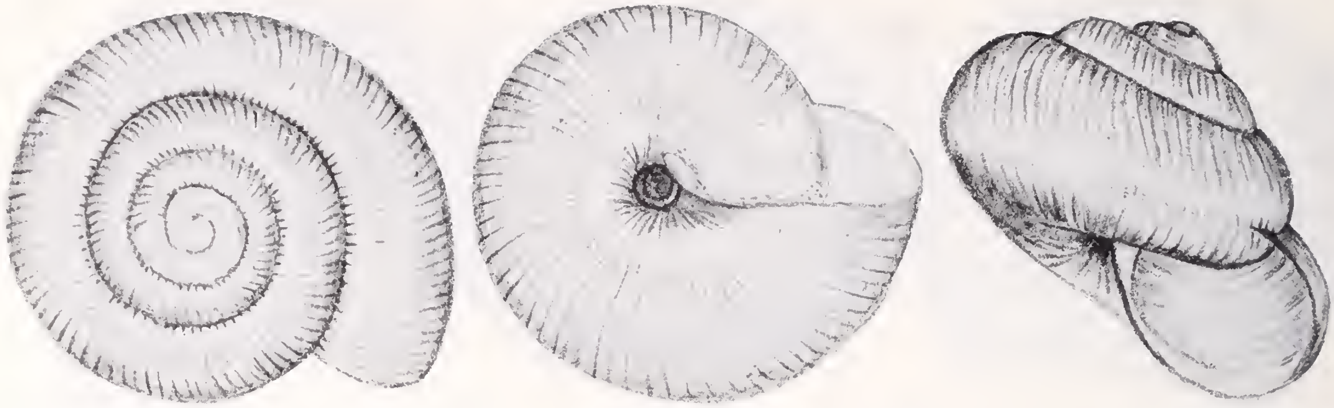
I have drawn two specimens, one quite domed, the other flat - the flat one had a pronounced periostracum, the other had none. This highlights the difficulties of identifying the punctids where salient features are few. "It's a matter of learning by reinforcement - the more lots I sort, the more automatic the recognition" (F.M.Climo)

Obanella rimutaka (Dell) 1.7 x 1.2mm Huia
Not uncommon, though there was no sign of Obanella N Sp.12 which occurs at Hunua.

Punctid N.Sp. 1 1.0 x 0.8mm Chateau Mosquito Track
The smallest and by far the most common of these small species. Golden brown, opaque shell with very close ribbing and nearly closed umbilicus.



Punctid N.Sp. 5 1.4 x 0.8mm West Coast Road
Characterised by closer, rather swept-back ribbing, golden brown with the umbilicus narrowly open. None of these small ones except N.Sp.1 was common and they are quite difficult to sort without sufficient numbers.



<u>Punctid N.Sp. 6</u> 1.2 x 0.8mm Titirangi

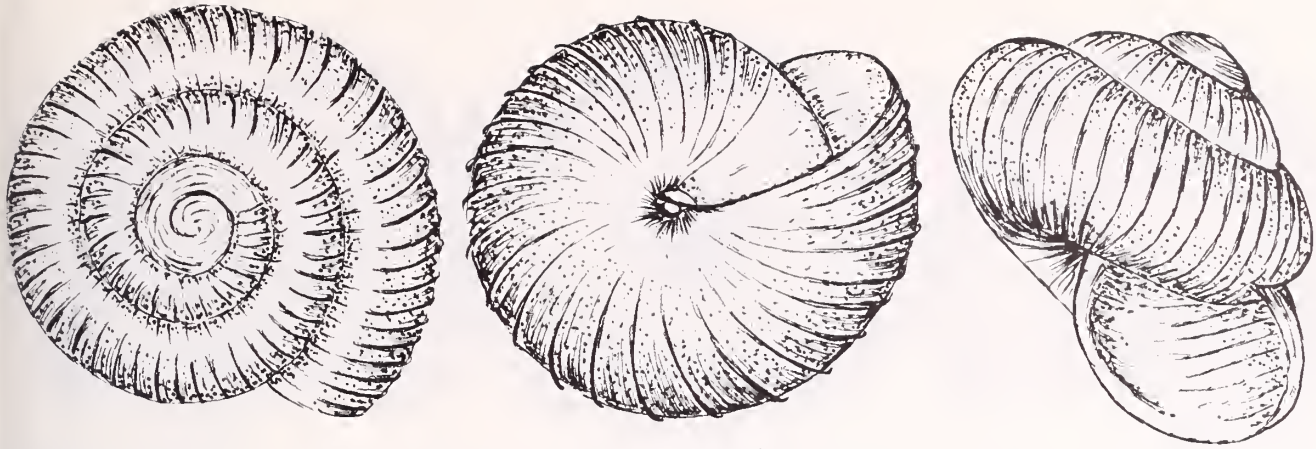
Not so flat as <u>N.Sp.5</u> with a yellowish-brown, semi-transparent shell. The umbilicus is considerably wider than <u>N.Sp.5</u>, though still narrow, but the shells are very similar

<u>Punctid N.Sp. 7</u> 1.3 x 1.2mm Piha

Both this species and the next are not common but are quite distinctive when good specimens are found. This one is slightly wider than taller, and has very wide ribbing

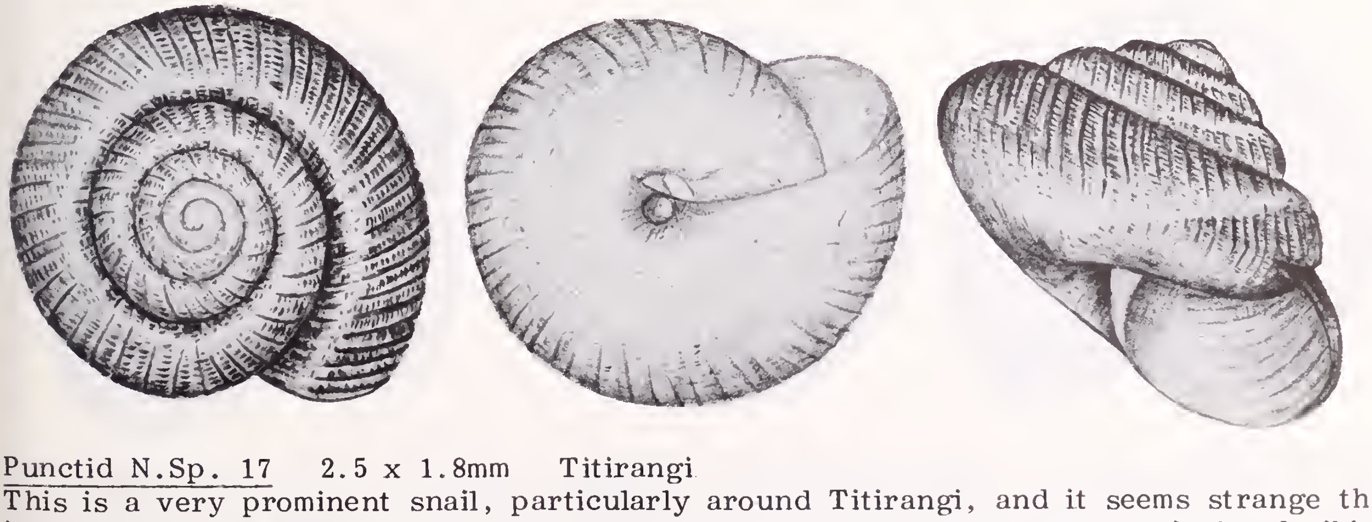
<u>Punctid N.Sp. 7a</u> 1.1 x 1.2mm West Coast Road

This one is slightly taller than wider and has much closer ribbing.

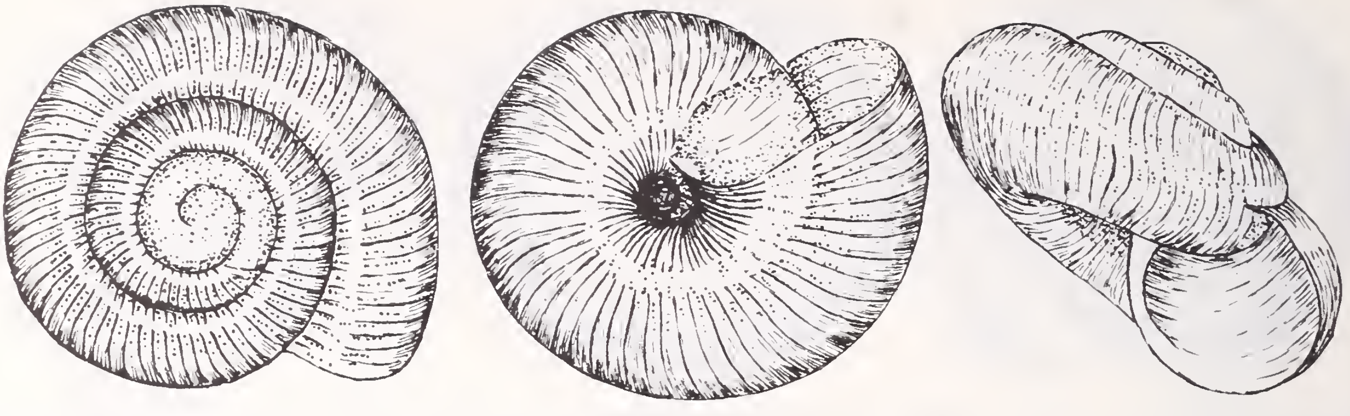


Punctid N.Sp. 8 1.0 x 0.9mm Chateau Mosquito Track
This one seems to be more plentiful and I have collected it from the Hunuas and the Coromandels.

Punctid N.Sp.15 1.2 x 1.0mm Huia Dam Road
A flattish shell compared with, say, N.Sp.7, with widely spaced, strong and probably platelike ribs, though they were mostly worn off in the two specimens I found.



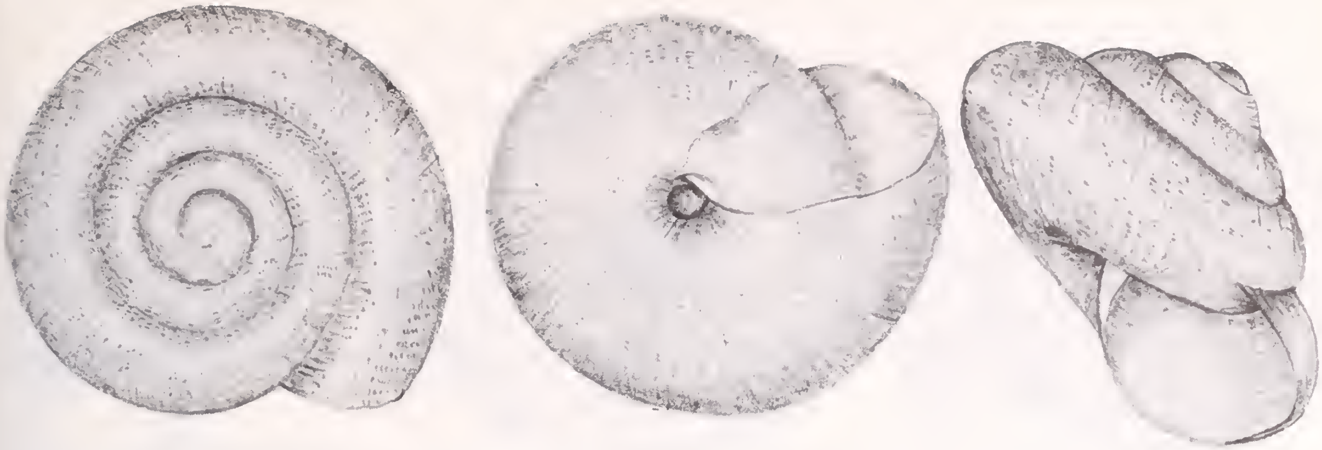
Punctid N.Sp. 17 2.5 x 1.8mm Titirangi
This is a very prominent snail, particularly around Titirangi, and it seems strange that it has not been described and named. Its golden colour and strongly reticulated ribbing make it a very striking shell.



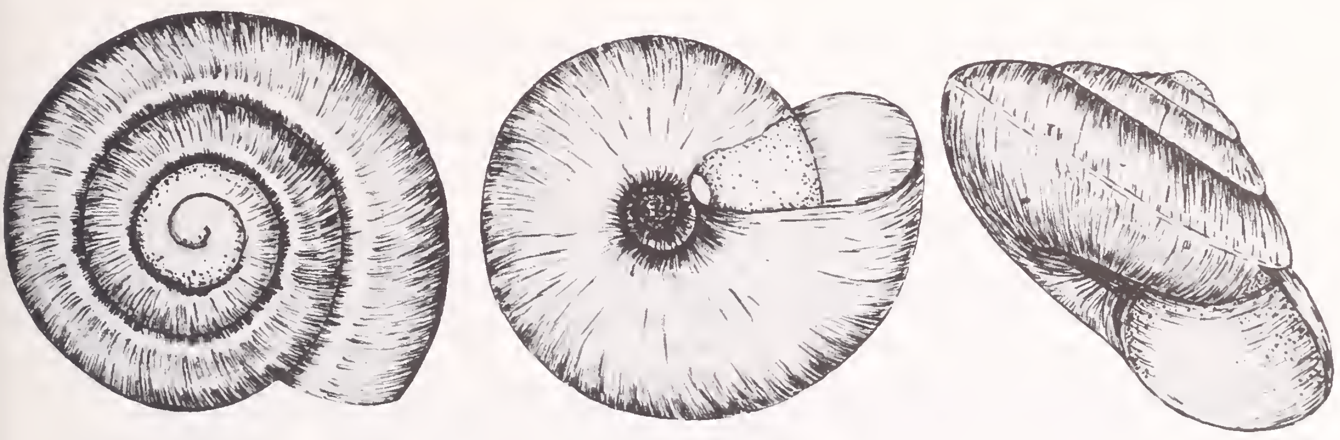
Punctid N.Sp. 29   1 x 0.6mm   Titirangi
This can be a prolific species but it was scarce in my collecting. It is easily confused with N.Sp.6, but Dr F.M. Climo points out that it has a larger protoconch.

Punctid N.Sp. 30   1.0 x 0.8mm   Titirangi
This was very scarce and I only found one or two.

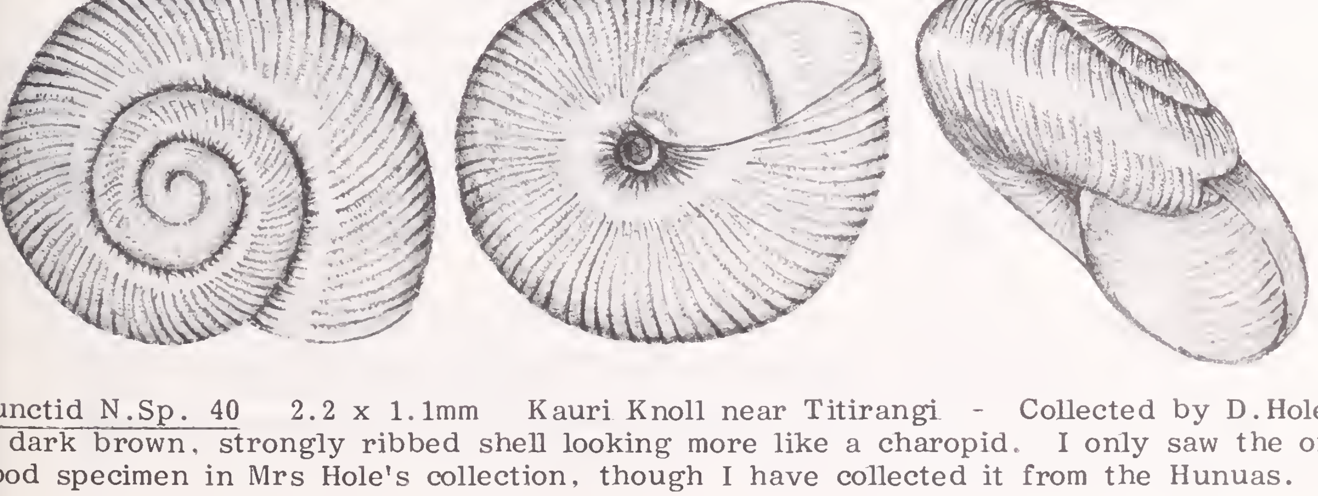
Punctid N.Sp. 32   1.4 x 0.8mm   West Coast Road
This is a very plain little shell, not common, which like many of the punctids would finally need to be compared with some known specimens for an accurate identification.



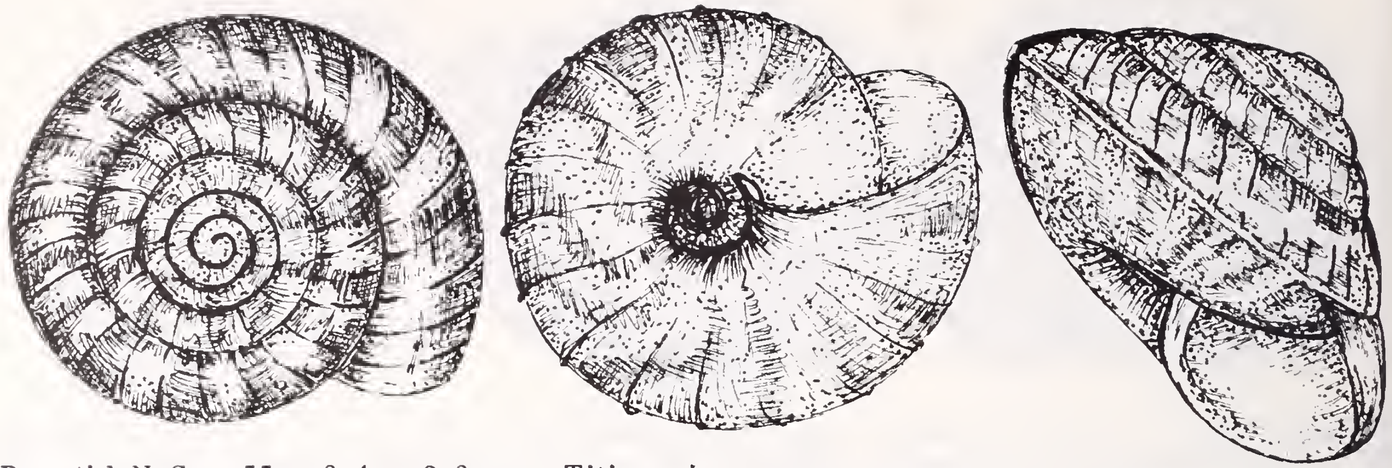
Punctid N.Sp. 33   1.4 x 0.9mm   West Coast Road
For a while I called these juvenile N.Sp.17, for they have the same spiral sculpture though much subdued. They are reasonably common over the whole area.



Punctid N.Sp.38   1.7 x 1.0mm   Houghtons Bush
I found this species in a very sandy situation at Muriwai and also near Huia and at Waikowhai in similar habitats close to the sea.



Punctid N.Sp. 40   2.2 x 1.1mm   Kauri Knoll near Titirangi - Collected by D.Hole
A dark brown, strongly ribbed shell looking more like a charopid. I only saw the one good specimen in Mrs Hole's collection, though I have collected it from the Hunuas.



Punctid N.Sp. 55 3.4 x 2.3mm Titirangi
One of the common species in the Waitakeres. Older shells have a pallatal lamella tucked up in the top corner, which is a feature absent in the Hunua specimens where it is more common still. Mrs P. Mayhill showed me a Waitakere specimen quite sharply angled - almost carinate - but with the primary ribs fully developed into quite tall plates.

A DISCUSSION and DESCRIPTION of COLLECTING SITES

All the collecting for this survey has been of a "Hit and Run" nature. All the snails have been sorted from leaf mould taken from various sites and brought home. The only other collection I have seen in total belongs to Mrs D. Hole of Titirangi, who appears to have collected most of hers live on the spot. Though she has the same snails, the proportions are very different. From the conversation I had with her, I gathered that she preferred very damp litter and as a result she had, for example, many specimens of cf pseudanguicula, whereas I only had one or two. Her collection included countless P. Conellas but no P. fulguratas. I mention this to draw attention to the fact that one person's collecting sites can have a strong bias and that this does affect the proportions of the snails collected.

My own bias has been very strong, for I have concentrated almost exclusively around the base of large trees, particularly Rimu and Kahikatea and, to a lesser extent, Rata, Puriri, Pohutukawa and Kauri. The logic I have followed is this : for the quick sortie the best place to find a concentration of shells, albeit dead, is at the bottom of a vertical habitat where the snails just drop off and collect. The Rimu is the perfect answer to this line of thought, for it provides a trunk with lots of peeling bark which can also be festooned with moss and epiphytes. Many snails live on the trunk - under the bark and in the moss in amongst all the fine composting debris caught there. The Rimu has an added bonus in the heap of bark which builds up at the base and provides a mass of protected rotting surfaces for snails to graze on. Finally, the needle-like leaves coating the ground compost quickly into a lovely fine material which provides much food for small species. At the other extreme, Kauri is quite poor for its bark is close and hard, and the leaves compost slowly and are shunned by snails.

This type of habitat is quite dry and on the whole seems to favour Charopids rather than Flammulinids or Punctids, though this is a very general observation. My most glaring omission on this survey was the Nikau, for I have always found the Nikau litter composed of rotting seeds quite barren. Fronds, of course, are a different matter and my failure to collect here can be reflected in the relatively low numbers of Phenacohelix ponsonbyi in my lists.

I have divided the area into four, as indicated on the map, and now describe the sites.

AREA "A"

1. Waikowhai Reserve
In spite of being badly abused in the past, this patch of bush is regenerating fairly well and retains a remarkable number of species. The two litres of litter I collected from an assortment of sites on the upper side of the road leading to the beach.

2. Green Bay
Just across the road from the Scout Camp is an area of Reserve planted mainly in pines but with an understorey of native plants. I did some live collecting here.

3. Atkinson Park, Titirangi, just across the road from the start of the track (top), under young Rimu and tall Manuka - two litres of leaf mould.

4. Same - some distance down the track under a large Puriri - two litres.

5. Same - under a very old Rimu alongside the track. This was one of the most fruitful sites in the whole survey. Two litres.

6. Same - much lower down the track under Kahikatea - two litres.

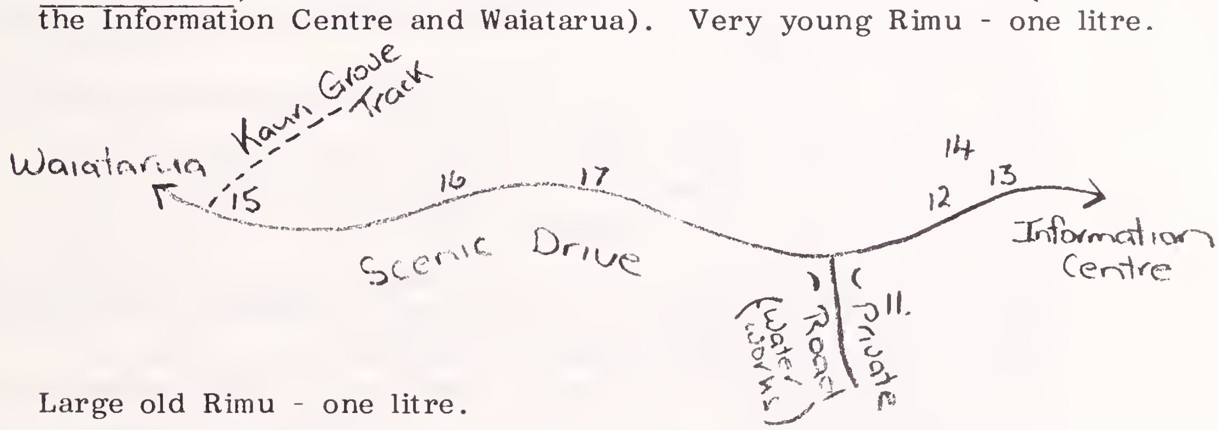
7. Titirangi Beach on the eastern ridge above the carpark under a Kauri - two litres.

8. Titirangi, the path that goes along the top of the concrete aqueduct from the Filter Station - under Mahoe and Rangiora, two litres.

9. Same - under Nikau - two litres.

10. Same - under Rimu - two litres.

11. Scenic Drive, the mature bush around the Kauri Grove track (between the Information Centre and Waiatarua). Very young Rimu - one litre.



12. Large old Rimu - one litre.

13. A deep, wet pile of Nikau fronds at base of an old Rimu.

14. In amongst Dracophyllum at base of old Rimu - two litres.

15. At base of large Rimy close to the road - two litres.

16. A very large Rimy close to the road - two litres.

17. Same - one litre.

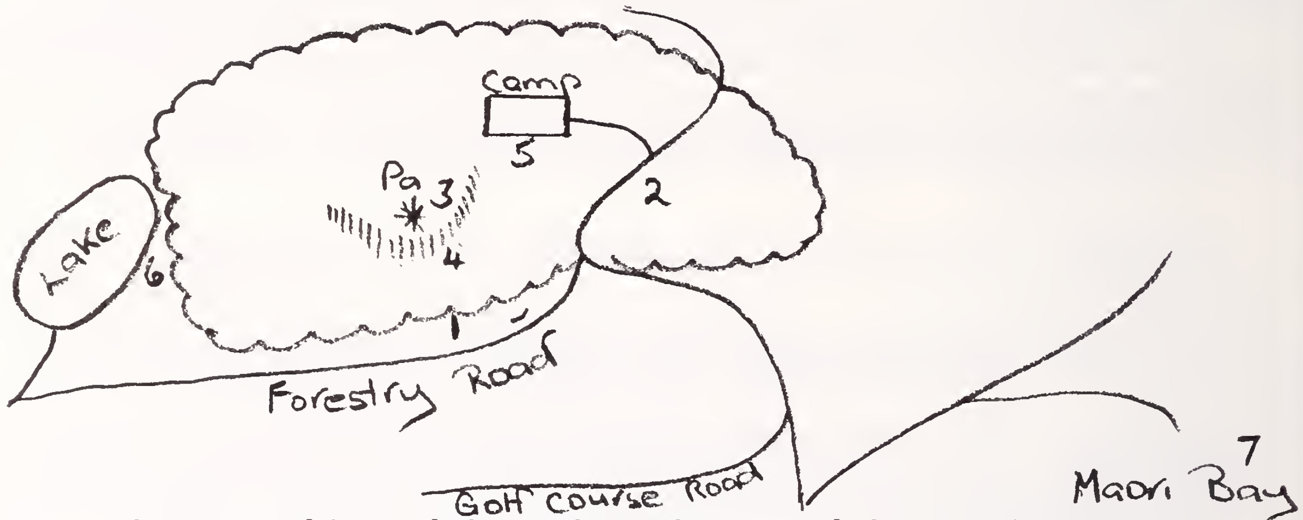
18. Atkinson Park - another large Rimu just across the stream from Site 5.

19. Same - another large Kahikatea alongside the track just below 5.

20. Several litres of leaf mould taken progressively while walking along the old Exhibition Drive from the Filters to Mackays Rest. It was all taken under Blechnum capense overhanging the side of the road in many places.

AREA "B"

Houghtons Bush. Muriwai



1. The bottom fringe of the bush on the edge of the sandhills, under Pohukawa, Karaka and Nikau - one litre.

2. Just below the camp driveway on opposite side of the road under a large Puriri - one litre.

3. At the site of the Maori pa under a large Puriri - two-thirds of a litre.

4. On the steep slope beneath the pa under a Karaka - one litre.

5. Close beside the camp building under a large Pohutukawa in amongst Nikau, Mahoe and Karamu - one litre.

6. At the western end of Houghtons Lake, under second-growth Titree and Mahoe - one litre.

7. Maori Bay, between the beach and the cliffs, under Kawakawa and Mahoe adjacent to a lot of Flax - one litre.

8. General collecting in Nikau fronds in Houghtons Bush.

9. Nikau fronds at one spot, Goldies Bush.

10. Goldies Bush - all these were collected along the top part of the track before it descends steeply to the waterfall. This site under Puriri alongside Tree Fern and Karamu - two litres.

11. Goldies Bush - under a very large Kahikatea in a wet hollow surrounded by Nikau - one litre.

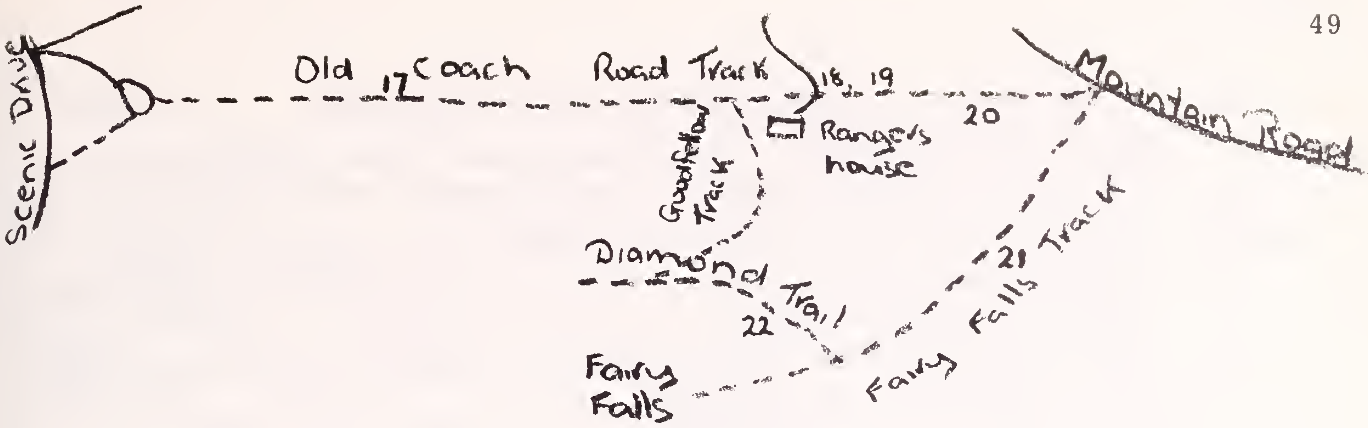
12. Goldies Bush, start of track, under Titree - one litre.

13. Close to previous, under Titree and Matipo - one litre.

14. Goldies Bush, under a large Puriri - one litre.

15. Waitakere, Bethells Road, just above Black Bridge, alongside stream under a fallen, rotting Puriri trunk - one litre.

16. Cascades, under a large Rimu just above the swing bridge - two litres.



17. Fairy Falls - Old Coach Road Track - an old Rimu near the top end - a quarter litre.

18. Old Coach Road Track - a large Rimu, just below the Ranger's house - half a litre. This track is on a ridge and comparatively dry.

19. Old Coach Road - a large Tawa, a short distance below the Ranger's house.

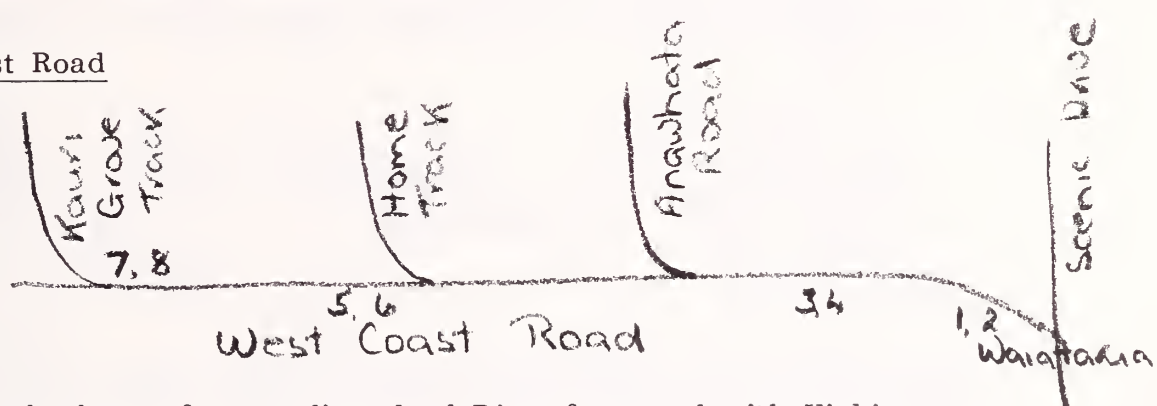
20. Old Coach Road towards the bottom end under a large Rimu and Tawa growing together - one litre.

21. Fairy Falls Track at the bottom end in the valley, under a very large Rimu in a very dark damp spot - two litres.

22. Diamond Trail - halfway up the very steep lower end overlooking the Falls under a large Rata - two litres.

AREA "C"

<u>West Coast Road</u>



1. At the base of a standing dead Rimu festooned with Kiekie - two litres.
2. Within a few metres of the last at base of live Rimu - two litres.
3. Under a large Totara, on a very steep bank where the bush was very dense and the ground covered in impenetrable Kiekie - two litres.
4. About 20 metres from last, in a small gully under a large Rimu - two litres.
5. Under a large Rimu - two litres.
6. A few metres from last Rimu, under a general canopy of trees including Nikau, Tree Fern, Kohekohe, Tawa - two litres.
7. At base of large Rimu - two litres.
8. Close to last, under a fallen, rotting Rimu log - one litre.
9. Piha valley, Byers Track, at the foot of a small, mossy cliff - one litre.

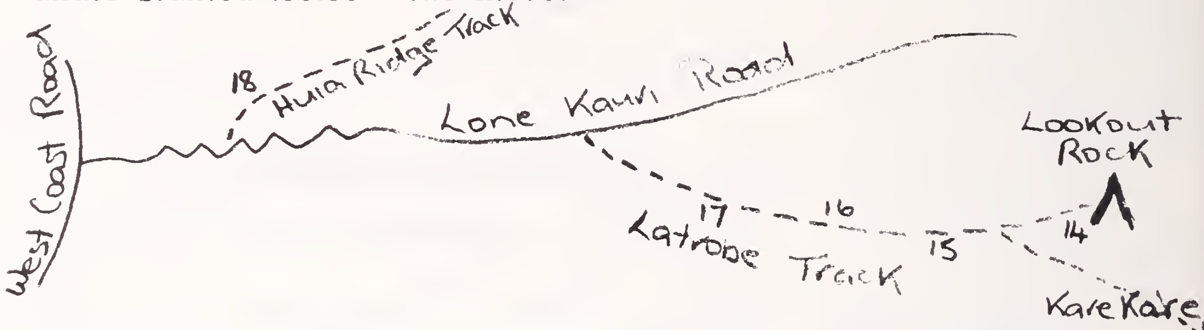
10. At the base of a Kahikatea, Byers Track - one litre.

11. Byers Track, alongside a cleared picnic area under a large heap of Nikau fronds perhaps dumped there to compost - one litre.

12. Byers Track, under a Puriri - two litres.

All these Byers Track sites were within a radius of 100 metres on very damp, well-bushed river flat.

13. At the junction of the Chateau Mosquito Track and the R.G.B. Track, under stunted toetoe - two litres.



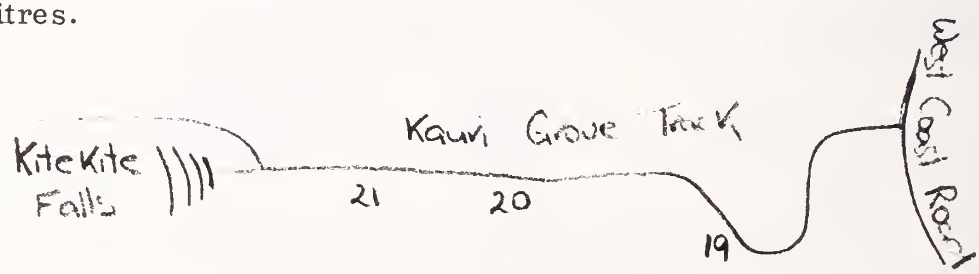
14. At the base of Lookout Rock on Latrobe Track, under an epiphyte growing on a boulder - one litre.

15. Under a very large Pohutukawa growing on the side of the track where it is almost a cliff - two litres.

16. Under a grove of Taraires - two litres.

17. At the base of a large old stump surrounded by Rewarewas - two litres.

18. Huia Ridge Track near the Lone Kauri Road, under an old Rimu - two litres.



19. Kauri Grove Track, Piha, near the top in virgin bush, at the base of a large Rimu. This was near the lower extreme of the big trees on this track - one litre.

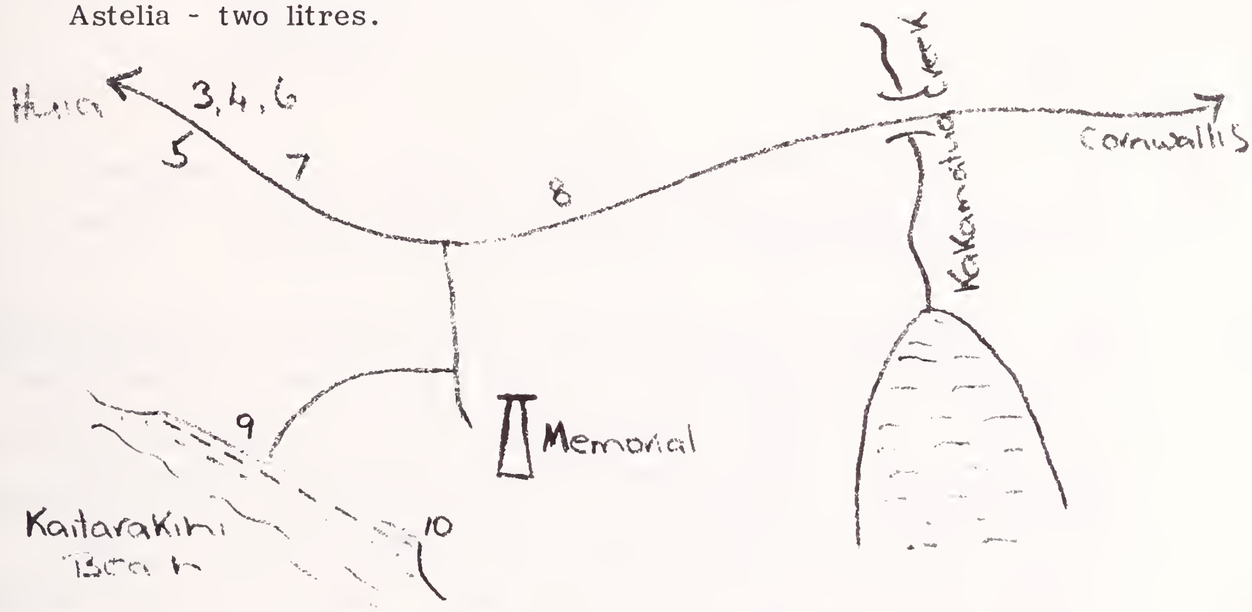
20. Further down in rather poor second growth bush under Tree Fern - half a litre.

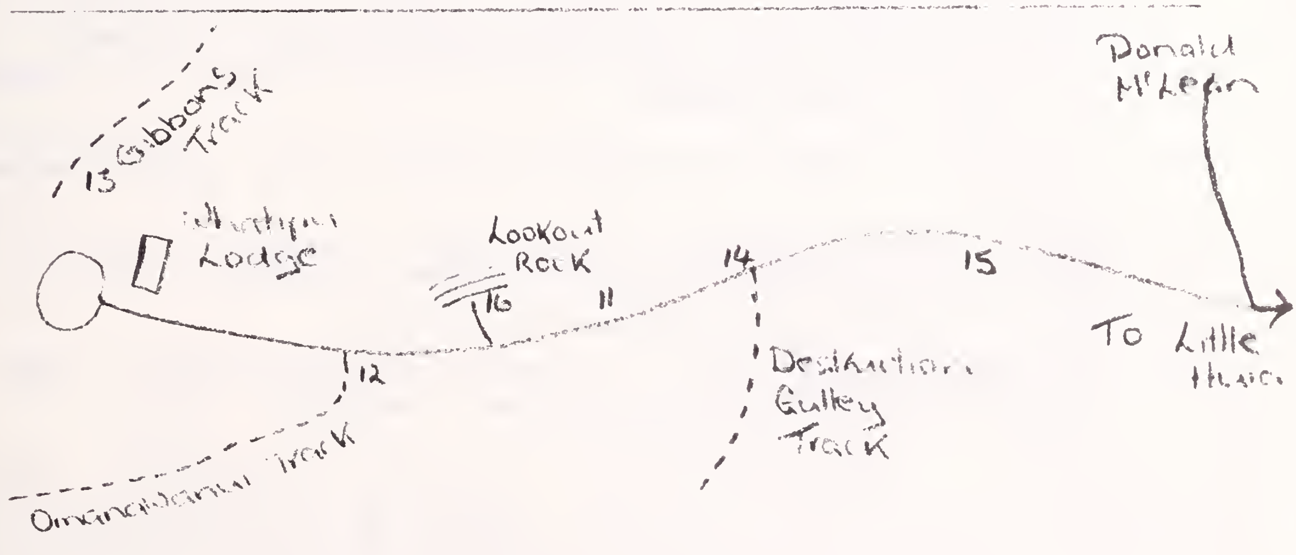
21. Further down still, not far above the falls, alongside the stream, under Five Finger. The bush was still quite poor here - one litre.

22. Nikau Grove, Piha, at the end of Garden Road. I took two litres of litter in the gove and up the hill to the south a little under Puriri. This bush looked very modified, perhaps burnt over, and yielded few species, though the individual specimens were quite large.

AREA "D"

1. Mill Bay, under a large Kahikatea - two litres.
2. Mill Bay, on a coastal cliff just above high water mark, under Maidenhair Fern - one litre.
3. Kakamatua - Huia Road. Collected on the spot under Titree.
4. Under a heap of Ponga fronds - two litres.
5. Across the road, under one large shiny-leafed Pittosporum growing amongst a lot of Toetoe, Bracken and Blackberry - two litres.
6. Under Ponga debris - two litres.
7. Under Ponga - two litres.
8. Taken under a Macrocarpa with a lot of Astelia and Tree Fern underneath - two litres.
9. Just above the Kaitarakihi Beach, under an old Puriri with a lot of epiphytes - two litres.
10. Just above the Kaitarakihi Beach eastern end, under Pohutukawa and Astelia - two litres.





11. Alongside road at top of Whatipu Hill, under Puriri amongst Kiekie - one litre.

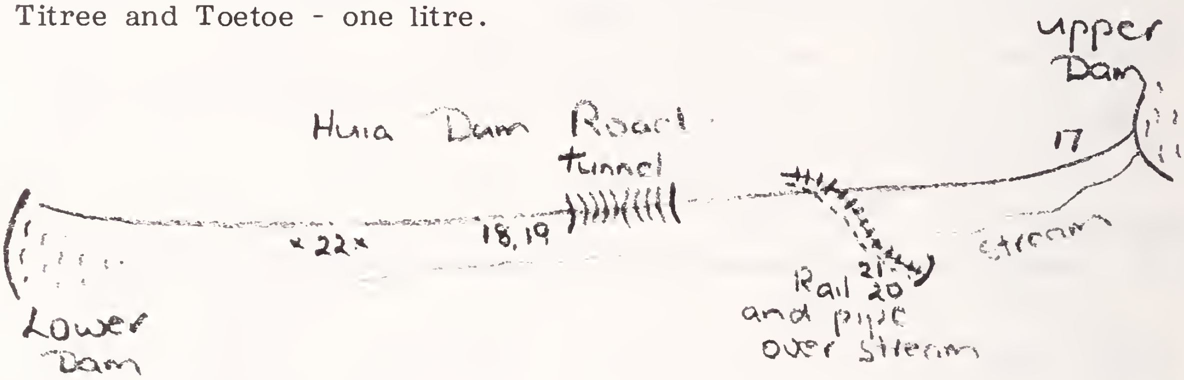
12. At start of Omanawanui Track, under Nikau and Tree Fern - two litres.

13. At start of the Gibbons Track, under a Puriri very close to grazed land - two litres.

14. Just across the road from start of the Destruction Gulley Track, under Nikau - one litre.

15. Near Donald McLean turnoff, under a large Mahoe - one litre.

16. Half way up the Whatipu Hill, alongside an observation rock, under Titree and Toetoe - one litre.



17. Under a large dead Totara, just below the upper dam - one litre.

18. Alongside a large dead tree, just below the road tunnel. This was one of the two best sites I sampled on the whole survey.

    After the initial one-litre sample yielded some species I had not previously seen, I returned to the site and eventually sorted some 12 litres of litter. A considerably rocky pyramid was actually topped with two large dead trunks, the older a Rimu still containing a few live epiphytes high in its branches. The second, hugging the first, was a recently dead Rata still shedding bark. The three most interesting species Charopa cf pseudanguiculas a, Phrixgnathus cf moellendorffi and Fectola unidentata all came from very fine dry material close under the Rata and were obviously living on the trunk under the bark. They were not seen in the general litter further down the pyramid. The other species prominent in this same spot, but not so obvious further down, were H. hectori, P.ariel and P.erigone. The collecting area here was a triangle encompassing about three square metres which yielded 55 species, and though I separated several areas within the main one I have lumped them together in these records.

19. At the base of a dead tree close to 18, but in a lower, darker situation - one litre.

20. Under a rocky cliff just over the small railway bridge, alongside the pipeline. The leaf litter was mostly Rangiora - one litre.

21. Under a large Rimu close to that cliff - one litre.

22. I have joined two sites here - two Rimus some distance apart, a fair way down the road from the road tunnel - two litres.

AREA "A" - Sheet (i)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
R.greenwoodi																						
R.dunniae																						
D.coresia	4				18		1		2	3				2		10	1		3	5		
D.jeffreysiana																						
Sch.novoseelandica																						
O.dimidiata																						
O.purchasi				2	20														2	2		
C.cytora							3															
C.hedleyi			4				2			5		1		3	2							
C.torquilla					4															1		
C.pallida									1		1	3								5		
C.fasciata																						
L.egea	4									3								1				
L.h.carinella			2		5							2	1	2				1		12		
T.novoseelandica	1				8	6			1									1	2	2		
T.subperforata																						
C.pseudanguicula				4	5	1																
C.cf.pseudanguicula																						
C.chrysaugeia					1																	
C.coma				1	22	4												6	5			
C.fuscosa																						
C.ochra																						
C.titirangiensis				1	1	1																
C.transenna																						
C.pilsbryi																			1			
H.hectori				3	3							2		1				4	6			
H.pseudoleioda	1		7							6									1	1		

AREA "A" - Sheet (ii)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
C. buccinella				1	1	1			1									3	1			
C. roseveari																			1			
F. infecta					6							1										
F. mira						1																
F. costulata																						
F. cf. costulata a						1																
F. cf. costulata b						1																
F. cf. costulata c					3																	
G. microrhina																			1			
M. eta	14			6	80	20	2		1	1		8					2		18	4		
"M" sp. 1																			3			
"M" sp. 3				1	20				2	2	7					2			3			
"M" sp. 4				4														2				
E. egesta																						
T. celinde			1	2	1	1				6				7		1	3	1	1			
T. neozelanica	1			2	26	5	2			3	2	5	2		7	9	5	1	20			
T. tamora				4		2					1	3			6		3		1			
S. ide												1	1							3		
F. chiron																						
F. cornea																						
F. feredayi																						
F. perdita	2			2		5			2	2		3				4			2	1		
T. decidua																						
S. kivi					1	1				3					2	1			1			
T. ziczag	1						2				1				2							
A. dimorphus																		2				
A. tesselatus			2																			

AREA "A" - Sheet (iii)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
A. planulatus																		1				
A. urquharti																						
P. pilula						1			1										1			
P. cf. pilula						2		6	2											17		
P. ponsonbyi		3		2	19	7						6						4	3	1		
L. leimonias		1																				
L. pirongiaensis																						
L. cf. pirongiaensis							33								11							
L. marina	6																					
L. cf. marina	5						1													2		
L. poecilostica		2		1		6	1		4	8		5	1	6	10	3		11	4	12		
L. cf. poecilostica			8								2	2	2	3				1				
L. mariae																						
P. ariel	1			3	4	1			1							1			2			
P. cheesemani																						
P. conella						20				2				1	2	1		1	5	2		
P. erigone				1	10			5	3		3	2			2			6	3	49		
P. francesci																						
P. fulguratus				2	10	25	3						2	2	3	6	2	1		2		
P. glabriusculus											1									3		
P. lucidus		1																				
P. miserabilis																						
P. moellendorffi						1						1										
P. serratocostatus																			2			
P. viridulus																						

AREA "A" - Sheet (iv)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
O. rimutaka																			1	2		
P. lateumbilicata	1									1									3			
P. caputspinulae																						
P. jungermanniae	2				3			1									1		2			
Punctid sp. 1			1				8											1				
5																						
6				1	1													1	2			
7																			2			
cf.7					2																	
8																		1				
17			1		3					3	2	3				2		1				
29					2	1	1			1								1	1	3		
30								1														
32																						
33														1				1				
38	1																					
40																						
55						20	1				2							5	4			

AREA "B" - Sheet (i)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
R. greenwoodi					1			2														
R. dunniae																						
D. coresia	4		7	4	8					1	1	2			5	1		1	2	2		1
D. jeffreysiana																						
Sch. novoseelandica																						
O. dimidiata																						
O. purchasi																				4		
C. cytora																						
C. hedleyi			4							1		1						4		2		
C. torquilla					1										1	1				1		
C. pallida	3	1	3		5			2	3	1		2	2		7			1		2	1	
C. fasciata	4																					
L. egea															2	2						
L. h. carinella	1		9		8			1														
T. novoseelandica		1		16		2					1					1					1	
T. subperforata																						
C. pseudanguicula															1						2	
C. cf. pseudanguicula																						
C. chrysaugeia																					7	
C. coma																					17	
C. fuscosa																		1				
C. ochra															1			1			4	
C. titirangiensis																						
C. transenna		2								1											1	
C. pilsbryi		1		1																		
H. hectori										1						1				2	28	1

AREA "B" - Sheet (ii)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
H.pseudoleioda																1						
C.buccinella					1								1	1								
C.roseveari																						
F.infecta				2																		
F.mira											1											
F.costulata																						
F.cf.costulata																						
F.cf. costulata a																						
F.cf. costulata b																					1	2
F.cf. costulata c																						
G.microrhina																						
M.eta				42	3		3						2		2				1	5		
"M" sp.1																						
"M" sp.3										2	1				10			2		2	30	3
"M" sp.4																					4	
E.egesta	1			1																		
T.celinde										2	4										6	
T.neozelanica					2					2	2			1	6	1		7		4	15	4
T.tamora		1			2					1				1		4		2	2	8	8	12
S.ide																		1				
F.chiron																						
F.cornea																						
F.feredayi																						
F.perdita	1	3	3	6	1	1											1	3		1		
T.decidua																						
S.kivi			1							1	1											

AREA "B" - Sheet (iii)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
T. ziczag	8	10		7	1			6		3				2	4							
A. dimorphus																						
A. tesselatus																						
A. planulatus											1											
A. urquharti															1					2		
P. pilula																						
P. cf. pilula															3							1
P. ponsonbyi	4			9			1	8		2	1	1			4		1	2	1	3	10	
L. leimonias																						
L. pirongiaensis													23	1				5				
L. cf. pirongiaensis																					1	
L. marina	9		14	3				3	1		2											
L. cf. marina										3		1	3	9	2	1		4			1	
L. poecilostica	3				5		4	5		9	6	2		4	1	3		2		6	6	9
L. cf. poecilostica																					2	
L. mariae																						
P. ariel															2						2	1
P. cheesemani																						
P. conella																			2			
P. erigone				11	3			1		7	1				3		1	7		2	21	3
P. francesci																						
P. fulguratus					1												2	2			2	
P. glabriusculus				3						2					1		1				1	
P. lucidus										3	3							1	8	1	12	
P. miserabilis																						
P. moellendorffi			2	4		1																

AREA "B" - Sheet (iv)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
P. serratocostatus																						1
P. viridulus																						
O. rimutaka				2													2				4	
P. lateumbilicata																3					11	
P. caputspinulae																						
P. jungermanniae																		1			1	
Punctid sp. 1																		4			8	4
5																						
6																		1			4	
7																						1
cf.7																			1			
8																						
17				2						1			1								2	
29																				1	2	
30																						
32																						
33																	3		1	1	2	3
38				8		1																
40																						
55			1										10	4		2						

AREA "C" - Sheet (i)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
R. greenwoodi													1			1					1	
R. dunniae					1											1						
D. coresia	1			5	2	1	2		1		5	8	1		5	2	1	3	4	2	2	2
D. jeffreysiana																						
Sch. novoseelandica																						
O. dimidiata																						
O. purchasi								5	1	11		9	20		1	1				1	8	
C. cytora																						
C. hedleyi			1	7			1		2			3	1		4		2					
C. torquilla																						
C. pallida	1	1		1	1	2	2	1	1									2		1		
C. fasciata																						
L. egea									4							1		2				
L. h. carinella									9	6	2	18	14		2						1	5
T. novoseelandica												2										
T. subperforata																						
C. pseudanguicula	1	1			1								1	1								
C. cf. pseudanguicula								3														
C. chrysaugeia								2													1	
C. coma																						
C. fuscosa		1			1								2			1			1			
C. ochra	2						1	4											1			1
C. titirangiensis																						
C. transenna					1	1		1														
C. pilsbryi				2						1												
H. hectori	1			1	12								4	6					3		1	

AREA "C" - Sheet (ii)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
H.pseudoleioda						1	1						6		11	3	1					1
C.buccinella					1	4	2		1			2	1	2	3							
C.roseveari	1					1				1											2	
F.infecta																						
F.mira						1						1										
F.costulata										1												
F.cf.costulata a		3																				
F.cf.costulata b																		1				
F.cf.costulata c		1																				
G. microrhina														2	6	1						
M.eta									7	43	10	17	2		11				11		2	9
"M" sp. 1								1					1					1	1			
"M" sp. 3	1			2	12	5	1	2		2				4	4	2			3	1	1	
"M" sp. 4																						
E.egesta																						
T.celinde	2	3		1	5			1					5		1				1			
T.neozelanica	2	6		21	8	3	5	4		1		3	4		4	1		3	2		2	
T.tamora	2	2	6	3	1	3	6		11	2	1	10		3	2	1		3	1		1	6
S.ide					1	1			1													
F.chiron																						
F.cornea																						
F.feredayi																						
F.perdita					4					6		11										1
T.decidua																						

AREA "C" - Sheet (iii)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
S. kivi		1				3		1													5	
"M" sp. 9																		1				
T. ziczag			2	1		1			2		3	1	2		1	3	1			1	1	3
A. dimorphus	1							2														
A. tesselatus																						
A. planulatus				1																		
A. urquharti		3	2	1		2	13												1			
P. pilula				2																		
P. cf. pilula				2		1			1		1	6				1					12	
P. ponsonbyi		1			8	1	1	5				1	2	2				1	7			1
L. leimonias			2							2	1				2							
L. pirongiaensis		1			1	2	2															
L. cf. pirongiaensis																						
L. marina							21	5			7	5	10			1		2				
L. cf. marina	2	4			3	1		3	4			1	2		2	1		1	6	2	6	2
L. poecilostica			1			10		2		6		2		40	4	2	2	2				1
L. cf. poecilostica			16																1			
L. mariae																						
P. ariel					1							4								1		
P. cheesemani																						
P. conella		1		1	1			3		5								3	4		1	
P. erigone	4	3		3	11	9	2	2		1		12	12	1	1	1		1	3	2	5	2
P. franceesci									1	2	1											
P. fulguratus				2			4				1	3						1	1			
P. glabriusculus					1	1				1	2	1						2				

AREA "C" - Sheet (iv)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
P. lucidus							4	1							1		5		3			
P. miserabilis		1																				
P. moellendorffi														4								
P. serratocostatus				1			3	1					4				1					
P. viridulus							1															
O. rimutaka	1			4	1	1	1	1		1											1	
P. lateumbilicata							6	9		1		2	13					2				
P. caputspinulae																						
P. jungermanniae			1		1																	
Punctid sp. 1		1		5	2	1							6		1					1		
5			1				5							2								
6																			1			
7			1																		21	
cf.7												1										
8								1					5									
17							3					3		1		1						
29									1				6									
30																						
32					5																	
33			1	4	1	1	1												1			
38																						
40																						
55	3	4	1	8		13						10										

AREA "D" - Sheet (i)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
R.greenwoodi																		5				1
R.dunniae				4			1															
D.coresia	3	2		1	16	4	2	3		3	5	7	1	8	7		3	16	3		1	10
D.jeffreysiana																						
Sch.novoseelandica																						
O.dimidiata												1										
O.purchasi					10	2	1		5					2	14			15	7			2
C.cytora																						
C.hedleyi	2						1	27		1		10	1			6		3				1
C.torquilla	1				1										1			3				
C.pallida	1					2		4			2	2		2		3		3	4			3
C.fasciata																						
L.egea	93												4									
L.h.carinella			11	5		13	5			1	10	7	3	7	11			24	8	2		4
T.novoseelandica		2							1	2												
T.subperforata																						
C.pseudanguicula											1							2				
C.cf.pseudanguicula a																		3				
C.chrysaugeia																		10				
C.coma									4													
C.fuscosa																						
C.ochra																		9			1	
C.titirangiensis																						
C.transenna																		4				
C.pilsbryi									1									2				
H.hectori															3			99	2			5

AREA "D" - Sheet (ii)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
H.pseudoleioda	1		1		3							4		3	1							
C.buccinella				2				2							2	17		13				
C.roseveari			2																			
F.infecta																						
F.mira																		10				2
F.unidentata																		6				
F.cf.costulata a																						
F.cf.costulata b																						
F.cf.costulata c																		9				
G.microrhina												10										
M.eta					7			11	2		10	3	6		17		5	31	4			10
"M" sp. 1																		1	4			1
"M" sp. 3		2								4		2		1	8	1		50	4		1	10
"M" sp. 4			1					2		1												1
E.egesta															2					3		
T.celinde	1																10	9	1			
T.neozelanica				2	3	4		7			2	2	1		5		2	10				1
T.tamora	1	7	2	1		4		2			4	10	8	3	5			53			2	10
S.ide								2	1								2	1	1	2		2
F.chiron					1																	
F.cornea																						
F.feredayi																						
F.perdita									1		1							19				
T.decidua																		3				1

AREA "D" - Sheet (iii)

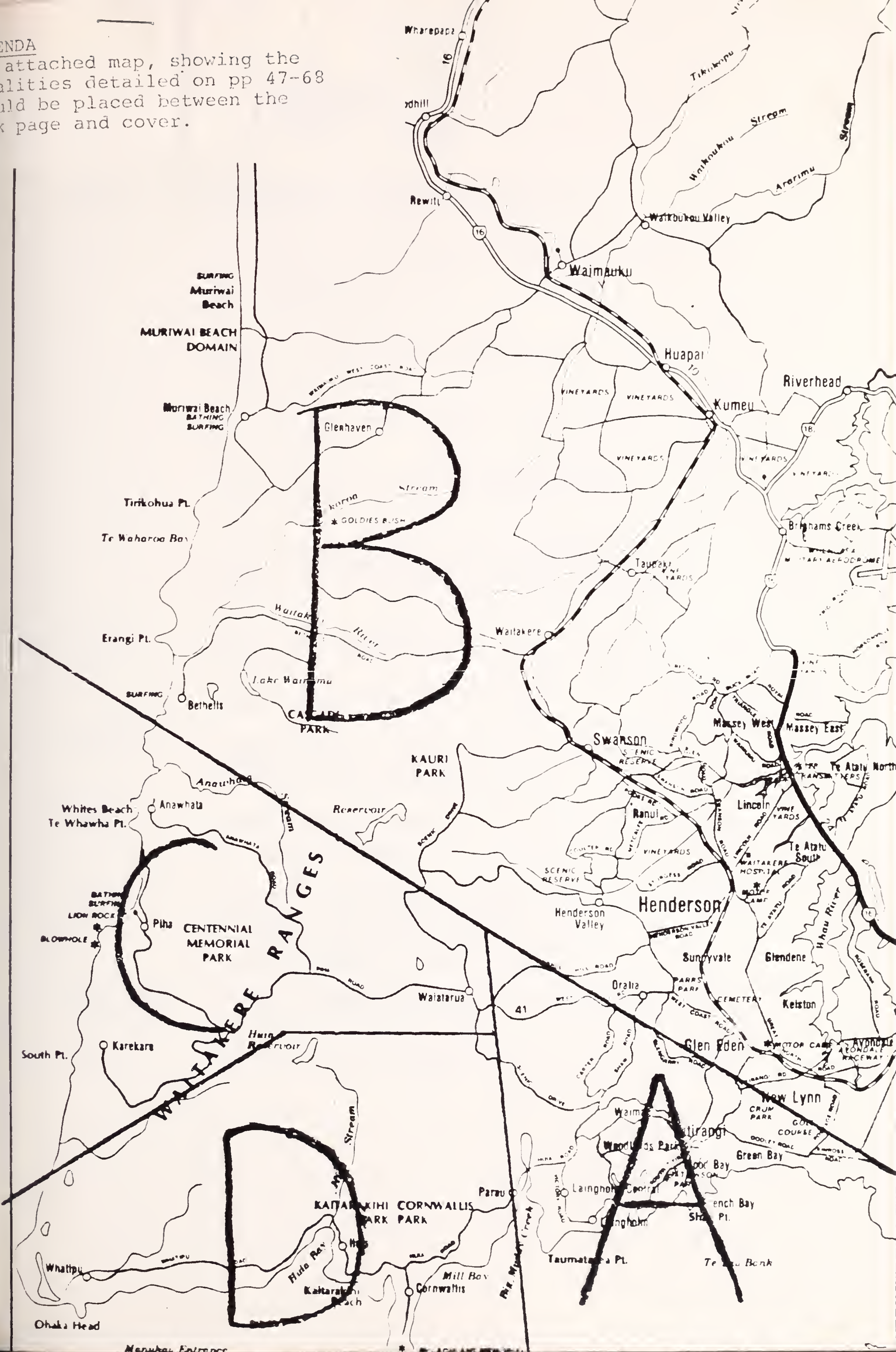
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
S. kivi					1						1				1			2	1		1	
T. ziczag			1	1	1	1			1		4	4						5	1			
A. dimorphus																						
A. tesselatus																						
A. planulatus																		6				
A. urquharti																		7		3	1	2
P. pilula								2		1						2						
P. cf. pilula					3						1	1			4			5	1	1		1
P. ponsonbyi		2		1	1	2	1		1	3	1				1		1	25	8		9	5
L. leimonias				3	6	2						1		1				28	5			1
L. pirongiaensis																						
L. cf. pirongiaensis																						
L. marina													7	10	35			1				7
L. cf. marina	1		3	1	3						15				6		1	9	1	2		1
L. poecilostica	1	8	3	4	1	5	2	19	3	1		6	1	1		1	1	19	4			1
L. cf. poecilostica								1													2	
L. mariae												6										
P. ariel											3							67	2			
P. cheesemani																		1				
P. conella	1											2						2				
P. erigone		14		1	4	4	6	5	2		1	7	1	2		2	1	53	34	2	2	15
P. francesci																						
P. fulguratus			1		3	1		4						1	2	6		3				
P. glabriusculus																		1	1			

AREA "D" - Sheet (iv)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
P. lucidus							1					5	6	4		1	10	9	2		5	
P. miserabilis												1						6				
P. moellendorffi	1											1			4							
P. cf. moellendorffi																		2	1			
P. serratocostatus		1				1										1						
P. viridulus																						
O. rimutaka																						1
P. lateumbilicata																39						
P. caputspinulae																						
P. jungermanniae																		2				
Punctid sp. 1								2					1	1		15						
5																		7				1
6																						
7																		1				
cf.7																						
8																		1				
17											1		1								1	
29					2							2			1	4		7				2
30																		1				
32																						
33							1		1	1								1				
38										1												
40																						
55			6															1				1
15																		2				

ADDENDA

The attached map, showing the localities detailed on pp 47-68 should be placed between the back page and cover.



REFERENCES

Climo	Classification of New Zealand Arionacea, perhaps the most important papers being :	
	II A Revision of Charopa subgenus Ptychodon	1969
	III A Revision of Charopa, Phenacharopa, Flammocharopa	1970
	IV A Revision of Otoconchinae	1971
	Review of NZ Charopine Snails with Lamellate apertures	1978
	All these from Rec.Dom.Mus. [later Rec.Nat.Mus.]	
	Landsnail Fauna of NZ "Biogeography & Ecology in NZ" [published by Dr W.Junk, The Hague, 1975]	
	A very large amount of as yet unpublished material which Dr Climo has kindly shown me, particularly relating to Punctinae	
Cumber	The Genus Therasiella Trans. Roy.Soc.NZ, Vol 10, No 7	1967
	Revision of the Genus Phenacohelix Trans. Roy.Soc.NZ, Vol 1, No 13	1961
Gardner	A Distributional Guide to the NZ Operculate Landsnail Genus Cytora Auck Conchology Section Publication	1979
Powell	Shells of New Zealand, 5th Edition	1976
	New Zealand Mollusca	1979
Poirieria	Vol 2, Pt 6 Field Day - Titirangi 1965 N.Gardner and Bulletin 15 1959	
	Notes on Land Snails Collected from the Waitakere Ranges - Roger Rees	
Solem, Climo & Roscoe	Sympatric Species Diversity in NZ Landsnails NZ Journal of Zoology, Vol 8	1981
Suter	Manual of the NZ Mollusca	1913

POIRIERIA

Conchology Section
Auckland Institute and Museum

Volume 13 Number 2

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C O N T E N T S

EDITORIAL

Numbering of Issues

As mentioned in the Editorial for Volume 11 No 2, there were only two issues in Volume 11. Volume 12 had one issue and this is the second of Volume 13.

We have had many queries regarding the 'missing' parts, but the numbering policy is simply that each year has a new Volume Number and there will be as many issues as contributors make worthwhile!

Missing Map

I regret the snafu that resulted in the Waitakere Map being left off the last issue. A special insert is enclosed with this issue, but should be affixed to Vol 11 No 2 (after the References).
I apologise to users and to Mr Goulstone.

And on a happy note -

It is very pleasing to note the geographical spread of contributors to this issue, and I would like to express my thanks to them all.

DEREK LAMB

MOLLUSCAN MEMORIES

John Graham (Oamaru)

When, after twenty years as a line fisherman, my first trawl came out of the water on 18 February 1957, an enduring interest in the benthic marine fauna was awakened in me. The record of my collections of recent and fossil mollusca now exceeds 7000 and the 155 cabinet trays and shelves of specimens constitute a storehouse of stimulating memories. As books hold, forever suspended in Time, the events and characters of fact or fiction, so most of my shells are catalysts which trigger the recollection of pleasant experiences, depict again the ocean, reefs and beaches, and re-introduce the personalities of interesting social contact.

Those purple-stained *Pachymelon smithi*, the hairy *Fusitriton retiolus* and the *Iredalina mirabilis* carry me back to the wind-tossed dawns on the edge of the canyon off Oamaru - the dank smelly sea-floor spoil; the confident throb of the motor; the first light blushing the mountain tops in the western distance; the wetness and the creaking of straining warps. *Penion fairfieldae* was common enough, as was *Argobuccinum tumidum*, swollen and furry, but those two *Columbarium mariae*, dead but only slightly impaired, were the only ones ever taken. The multihues of 80 *Chlamys delicatula* from 70 fathoms; *Chlamys gemmulata* and *C. dieffenbachi* in similar numbers and glorious colours, including many of the coveted yellow; the Maureas; the Cominellas; the Xenophaliums, recall the sun-drenched days at sea or the small world of flood-lit deck through the Stygian night. Those *Zeacolpus symmetricus, Agatha georgiana,* Splendrillia, Notolepton, Kidderia and many other tiny species were happily picked out from the buckets of debris brought ashore. The nearly 300 species of mollusca from the North Otago coastal waters are, with my echinoderms, an ever-present reminder of a happy marriage of commerce and academic interest. (Other Phyla of my collections are now at the National Museum).

Xenophalium pyrum and *Maurea selecta* take me to the sweep of Waikanae Beach and its replicas to the north - usually strewn with Alcithoe, Amalda, Bassina, Austrofusus and other species but, sometimes and disappointingly,scattered with only *Paphies subtriangulata, Dosinia anus,* but little else. That specimen of *Thais orbita* is from the rocky platform just north of Cape Foulwind, the *Cominella maculosa* were cast ashore at Paton's Rock, while *Cellana flava* reminds me of the white dazzle of tidal rocks and beach at Kaikoura. Ohope, Aromoana, Cape Palliser, Collingwood, Eastern Beach, Rabbit Island and Riversdale - I have walked miles on these and many other New Zealand strands, the distant turning point ignored and passed, a new objective selected, ever ahead ..... until, reluctantly, I have retraced my steps.

I look at a *Bassina pachyphilla*: I see before me the sweep of Tidal River beach on the southern extremity of the Australian continent by Wilsons Promontory, where a friend trained as a commando during the War. Tidal River, where squalls of red and yellow parrots splattered into the trees and then dripped into pools of colour on the ground below. There I found the one valve and a quarter of a mile further along the beach, incredibly, was the other valve in the receding ripple beside a host of busy *Polinices incei*. The big *Polinices sordidus* came from the mudflat beside the bridge from San Remo on the mainland to Newhaven on Phillip Island where that *Pleuroploca australasia* lay on the beach at Cowes; the Trivias and Phasianellas are from Cowrie Beach, just past the Shellhouse where the little penguins cross the road each night. The sun-rayed *Notocallista kingii, Fulvia tenuicostata, Niotha pyrrhus* and the delicate *Electroma georgiana* are from those lovely place names on Port Phillip Bay - Rye, Sorrento, Rosebud and Dromana. On the windswept rocks and bays of Flinders, Kilcunda and Cape Paterson I gathered a selection of Patellids, Trochids and tide-tossed Cones.

Unlike scallop dredges and prawn trawls, modern fishing trawl nets are designed to ride free across the bottom while the practice of steaming ahead, as the warps are hauled over the stern, ensures that most of the benthic debris is washed clear before the net is hoisted aboard. Mollusc collections from commercial trawlers, therefore, are usually sparse. However, my Columbarium species, Fusinids, Xenogaleas and Volutes and others recall the days and nights fishing the entire length of the New South Wales coastal waters from Cape Howe to east of Yamba. I passaged once out of Eden on the 'Simon Barjona', but only broken shell came aboard. But my many trips out of Sydney in the 'Nuova Guiseppe' have rewarded me with many splendid specimens. Once, we could just see the tops of the high-rise buildings of Sydney as we trawled close to the coastal cliffs and we brought on board that *Tonna tetracotula*, 18 x 15cm and new, but giving tenancy to an heroic hermit crab. The bottom there is fetid, with slimy dirty coal-like rocks. There are giant cuttlefish, supported by 'bones' not much smaller than canoe paddle blades. My *Neotrigonia margaritacea, Spondylus tenellus* and the cowry, *Umbilia hesitata*, and a hundred other species were taken in one day on a scallop dredger in 22 fathoms off Lakes Entrance, Victoria. The 2-metre steel dredge spewed out its contents on to the sorting deck every 15 minutes and 80 other similar vessels worked beside us on an area about the size of a provincial town. I am assured that the grounds rapidly recoup from this intense exploitation - at that time, 30 large sacks allowed daily for each dredger. Two years later, I made a night trip on the prawn trawler 'Panare' out to 100 fathoms off Tweed Heads on the New South Wales/Queensland border. She worked three adjacent nets at the one time and, when the 'codends' discharged the catch on to the sorting table, about two sacks of that Xenophora species tumbled out. These were quickly chuted over the side, but I was able to retain good specimens to accompany the *Ericusa sericata, Ternivoluta studeri, Cassis nana* and some other notable additions.

I have sheltered from high winds twice with 'Kapala' in Coffs Harbour, the banana centre of New South Wales. On the harbour beach I found *Pholas australasiae, Cabestana spengleri,* and *Thais textilosa* entirely encrusted with polychaetes. A quick re-look before we sailed in April 1978 discovered a *Xenogalea labiata*, just cast ashore. There, last year, two *Turbo cepoides* were given me from the deck of the 'Derwent Hunter', an ocean sailer, on passage from Lord Howe Island to Hobart. The *Philippia depressiusculus* was in a pool at Seal Rocks where I chose the best *Pension maximus* from deep-water fish traps stored on the beach; the colourful Bankivias were cast ashore at Forster, further north. The rocks and squeaky sand on those New South Wales beaches have yielded their treasures - Twofold Bay, Bermagui, Narooma, Ulladulla, Shell Harbour, Manly, Palm Beach, Port Stephens and Tuncurry and many in between.

Last year I collected 280 species (mostly the tide cast) from the Caloundran reefs and beaches on the Sunshine Coast - *Janthina janthina* were strewn among the weeds on the high tide line, some *Cypraea errones* alive in favoured pools, *C. caputserpentis* nestled among colonial ascidians and *Astraea stellaris* washed by low-tide surge. I found those two *Phenacovolva rosea nectarea* on Shelly Beach and a companion for them in shell rubble on the beach at Port Cartwright; the *Littorina scabra* were in the mangroves at Golden Beach just beyond the stranding of a strikingly marked *Tapes turgida* and where little Nassarius tumbled in the verge ripple. I gathered those *modiolus sp.* and this *Cardita incrassata* and fifty other species on the tideline of the curving beach south of Burrum Heads in southern Queensland, selecting only good specimens.

I turned back when a sudden violent wind blew for about ten minutes and the beach became almost bare, everything covered by a blanket of blown silt.

My eldest daughter collected those *Atys cylindrica* and many others from the beach at Noumea; a son got those *Architectonica sp.* cast up at Songkhla, Thailand, the Cerithiums from Malaysia and he took me back in memory to 1941, to Sri Lanka where he found *Chama lazerus, Nerita plicata* and more. He made time, too, to fossick freshwater snails and mussels from a stream 10,000 feet up in Nepal. Another son took that giant *Haliotis midae* not far from Cape Town and those limpets from ocean beaches of South Africa.

When I look at different specimens, my thoughts traverse the last twenty-six years and I meet again memorable personalities - Batham, Climo, Dell, Fell, Fleming, Mannering, Ponder and Powell. I am reminded of those friends I have made and the few I have met - Bannah, Cleverley, Coleman, Constantine. Jamieson, Latham, Morgan, Turner, Valk and Wright, Johnston of South Africa who was given the ring from the mollymawk I banded here off Oamaru (it flew 7,500 miles to Mossel Bay); Huber from Switzerland who vacations at the Black Sea and the Mediterranean; Bruno of Genoa Museum; the biology lecturer at Miami University and La Bonte of Illinois, on holiday in the Gulf of Mexico.

As I work with my collections, my family refer to it as 'putting and taking'. I do this very often, but while I thus 'put and take', I re-live many, many happy and informative years .... Do you ?

A NEW RECORD FOR NEW ZEALAND

R.C.Grange (Auckland)

Cymatiidae Linatella cutacea (Link 1816)
(prev. Linatella cingulata Lamarck)

During the wash-up period at Te Arai Beach, situated between North Pakiri and Mangawhai, many members of the Auckland Shell Club spent their weekends hunting through the remains of this "Shell collector's dream area". It was not until the main wash-up had almost disappeared at the end of August that Club members Vas and Ron Firth found the *Linatella cutacea* pictured here.

This species appears in the New Zealand fossil records, but it apparently has not been recorded as having been found on our beaches.
It occurs in New South Wales and the Fiji Islands.
The specimen found on Te Arai is in very good condition, the colours are still fresh looking, and the shell would appear to have been living quite recently.

The shell is solid, with a moderately tall spire, ovate with an inflated body whorl, siphonal canal very short and broad. The outer lip has denticulations with dark brown markings on them. The colour is creamy white with narrow brown bands on the body whorls.

This specimen was idenitified by Mr W.O. Cernohorsky, Auckland Museum.

LITTLE FRENCHMAN'S

B. Elliott (Nelson)

On Anzac Weekend 1983, I tramped to Little Frenchman's in the Abel Tasman National Park, Nelson. Those who bought NZ Nature Heritage Part 4 (the issue with the Shell Chart) will find on the back cover a beautiful coloured picture of this delightful spot. Twelve years ago I was taken there by boat, and fell in love with the beautiful little beach, only 150 yards long, with its amazing variety of shells. Subsequent visits have been few and far between, as it is a six-hour tramp to get there, with no marked track for the last hour. I was pleased to find it still completely unspoiled, with not even a footprint on the beach when I arrived, though needless to say there were plenty of footprints when I left, as I examined the high tide lines very closely.

My main desire was to collect some complete specimens of *Limatula maoria,* and to my amazement I found over 160 of these pure white bivalves. The hinge of this species is extremely brittle; it is no wonder that complete ones are not common. *Dosinia maoriana* is another uncommon species found here, though on this visit I found only halves. Other species collected included *Haliotis virginea, Trichosirius inornatus,* and complete specimens of the small bivalves *Cardita aoteana, Gregariella barbata, Diplodonta striatula* and *Notocorbula zelandica.* One of the commonest shells found here is *Glycymeris laticostata,* many tiny, beautifully-patterned complete specimens. Several large specimens of the uncommon heart urchin *Apatopygus recens* were washed ashore, up to 40 mm.

On this visit the tide was high, giving no opportunity to collect low tidal species. On previous visits I have found *Haliotis iris,* numerous limpets including large *Cellana stellifera, Cantharidus opalus, Maurea tigris* and *punctulata, Buccinulum strebeli, Bouvieria ornata, Eudoxochiton nobilis, Cryptoconchus porosus, Longimactra elongata,* and many other commoner kinds of shells.

Land snails in the bush include *Rhytida meesoni perampla, Therasia sp.* and *Suteria ide,*making a total of over 150 species of shells for this tiny beach.

WASHUPS AT MT. MAUNGANUI, 1983

Nancy Smith
(Mt. Maunganui)

Having collected shells washed up on the beach at Mt. Maunganui for three years and then been away for two years, I was very interested to see what would turn up after the first storm since arriving home. We only received the tail lash of the big gale in June, but that was enough to make us watch the beaches carefully, hoping for a big wash-up. It didn't eventuate, but small localised ones were still occurring in July, with the usual hundreds of dead and live *Struthiolaria papulosa* as the common denominator. They rarely had a protoconch remaining and often had the operculums picked out by seagulls.

As usual, *Austrofusus glans* were plentiful, with a fair sprinkling of worn Alcithoe and Penions, and occasionally Mayena. Small *Xenophallium pyrum* in good condition were frequent, but the occasional *X. labiatum* was empty. Live bivalves were generally few and far between, and were the usual range of razor mussels, scallops, mactras, bassina, dosinias. For the first time I found a few live *Zenatia acinaces,* but they were all broken and I suspect the seagulls again.

New to me in this context were the hundreds of *Xymene ambiguous*, nearly all of good size for apparently 'male' shells, in good condition with egg capsules attached, and some with lovely purple interior colouring. The few 'female' types were small pale pink juveniles. Many of these creatures were actively trying to 'save' themselves by burying in the sand or finding a niche in an empty shell or a rock. Some of the Austrofusus and Struthiolaria had also dug in.

Amongst the wash-ups hundreds of *Tawera spissa* were popping in and out of the sand. Was I blind before, or were these opportunistic immigrants brought in by the storm? At the Papamoa end of the beach, along with the Tawera we found a few Nucula, some with lovely orange rays on the shell, and fellow collectors found one or two live Tanea here. We sometimes find them in the habour, but haven't seen them on the beach before. Empty Tanea shells used to be common on the beach, but are rare now.

News of a wash-up at Waihi Beach took us rushing up there, where we found evidence of big wash-ups on several consecutives tides, but the eyes had been picked out of them, by the local people as well as by the seagulls! Much the same shells but in greater quantities, bigger sizes and better quality - but very few *Xymene ambiguous*. Some of the Alcithoes had protoconches and I found a good Monoplex with periostracum intact. Of two nice *Cabastana spengleri* found, one had little barnacles on the columnella, beautifully enamelled over. Another collector showed us two more fine Hairy Monoplex and a mature, straight-sided Struthiolaria. This was interesting as I have two similar shells picked up on the Mt. Maunganui beach years ago, but broken round the lip.

So far, my best find has been a pure white live, small but mature Struthiolaria. Lucky was the teenager who found a dead but intact *Columbarium spiralis*. Not a very profitable winter for wash-ups, but still fun and interesting, and minus the niggling guilt I have when collecting live shells in habitat.

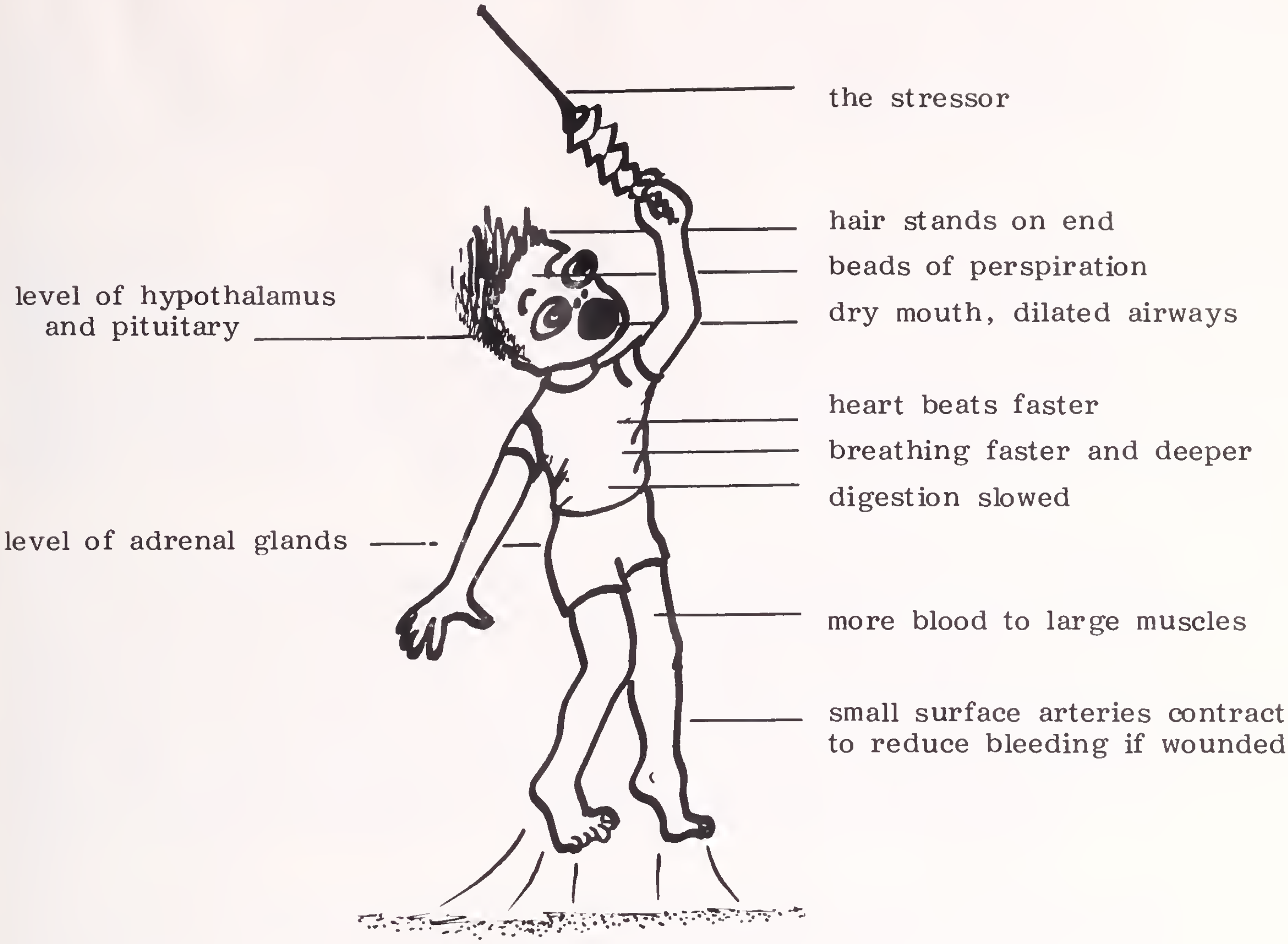
STRESS (or "IS YOUR SHELLING REALLY NECESSARY?")

Margaret Morley
(Auckland)

The word 'stress' has an unfortunate image. To most people stress suggests a nervous, overworked executive with ulcers, but is all stress bad? Spotting a rare shell causes exactly the same reactions in the body as discovering you have lost your wallet. (Diagram) Any cause of stress is called a stressor. Stressors can be long or short term, they vary in intensity and cause different reactions according to an individual's temperament and previous experience. Even the anticipation of an exciting wash-up enhances the body's reaction when the hope becomes a reality.

Let us look in detail at the chain of effects of any stressor, good or bad. The feeling of intense emotion is registered in the hypothalamus at the centre of the brain. The hypothalamus is a complex bundle of nerve cells about the size of the tip of your thumb. There are two effects of the stimulation. First, the autonomic nervous system is activated.

THE FIGHT OR FLIGHT REACTION



This controls all the body's involuntary systems, eg heart, respiration, circulation. Secondly, the pituitary gland just below the hypothalamus is stimulated to produce hormones. These are carried in the blood stream around the body. The thyroid gland in the neck increases the amount of energy available. The adrenal glands on top of each kidney are particularly affected. The hormone adrenalin and thirty others are poured into the blood stream producing the "fight or flight" reaction. In primitive man this was needed for survival, eg confronted with a sabre-toothed tiger, man was prepared either to stay and fight or to run away.

Nervous types will easily recognise the widespread changes caused by the complex interaction of the various hormones. The heart rate increases to supply more blood to the brain and large skeletal muscles. The blood pressure goes up. Respiration becomes faster and deeper to provide more oxygen. Muscles of the bronchi relax, saliva and mucus dry up to increase the diameter of the airways. (Maybe this is why a special shelling find results in abandoned screams of delight and mad notions of jumping and running?) Pupils dilate. Copious perspiration cools the body. Digestion and non-essential functions are thus mobilised for vigorous action.

Does this mean that shelling is bad for you? Not necessarily. The saying "To die of boredom" holds a genuine threat. Experiments have shown that we all need some stressors for mental health. Students were suspended in body temperature water, their sight and hearing occluded. The toughest could not tolerate these conditions for more than six hours. In a less drastic experiment, students were blindfolded in a soundproof room. After a day alone without normal sensory input, most were singing or talking to themselves. After two days the students were suffering from hallucinations, mental instability and disorientation. It took several days after release to return to normal.

The sloth also shows the results of a stress-free existence. He lives with an abundant food supply and no predators. His movements have evolved slower and slower until is is said the differences between a sleeping sloth and an awake sloth are barely significant.

In modern living, people with adequate income have shelter and a surfeit of food. Stressors have been removed and now must be actively sought out. They may be found by competing in sport, playing slot machines, vandalising, driving dangerously, watching TV violence, beating the wife or .... or collecting shells. Many people become addicted to their particular indulgence. The activity fulfills a need and is therefore repeated.

Next time you feel the urge for a shelling trip, you can confound the opposition with the perfect scientific excuse, "I need to stimulate my hypothalamus". On the other hand, if your adrenal glands are exhausted and ulcers imminent, leave the "find of the day" for me to pick up.

References

Walter Cannon	1920		
Dr Hans Selye	1950	1974	Stress Without Distress
Ogden Tanner	1976		Time Life. Stress

COLOUR PATTERNS OF TAWERA SPISSA (Deshayes, 1835) (Veneridae) IN THE FAR NORTH

Ron Cumber (Paihia)

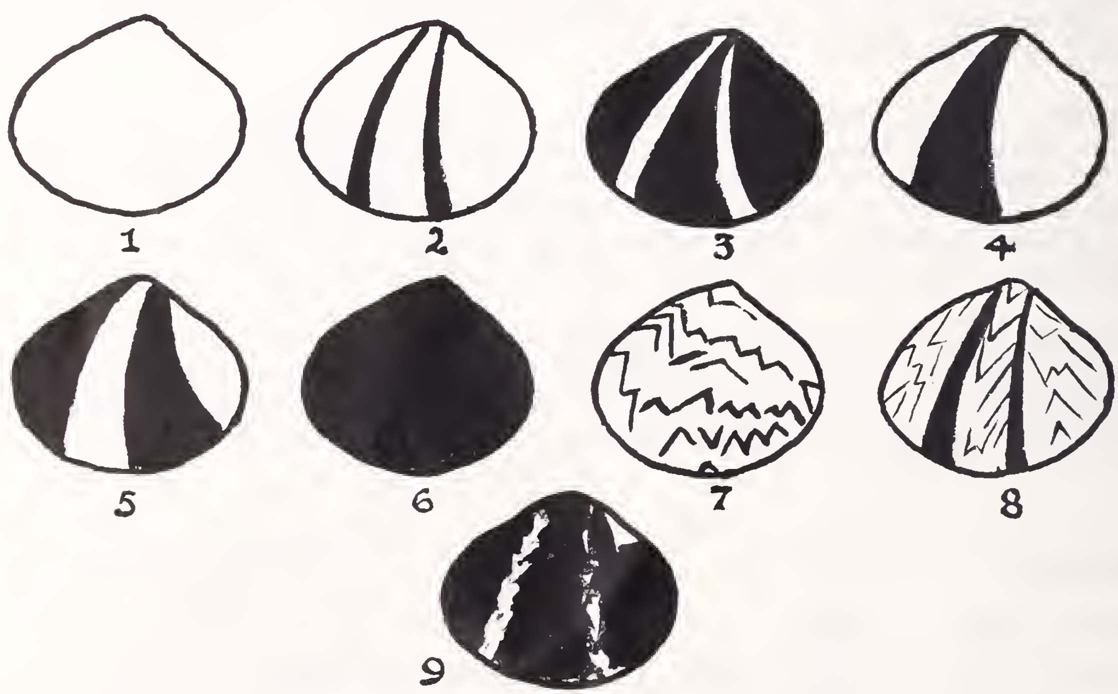
An extensive wash-up of *Tawera spissa* occurred in the Great Exhibition Bay - Tokerau Beach areas early in November 1979.

The patterns were beautifully illustrated in a large sample taken just south of Houhora Heads on 8 November 1979, and is the basis for this attempt to extract some order in the seemingly endless variety found at the one site.

A useful starting point is to select out the plain white specimens (Fig 1), and those which are completely covered in the chestnut brown colour (Fig 6). All patterns involve distributions of brown pigment deposited on an almost white background.

The colour so deposited may take two major forms - bands radiating from the umbo to the ventral margin, and randomly dispersed chevrons or zigzags. These latter must surely provide inspiration for designers of knitting patterns. (My wife has used them!)

If one disregards the zigzag patterns, the first interference with the plain white shell is the emergence of two faint brown lines which run from the umbo to the ventral margin, usually dividing it into three approximately equal white segments (Fig 2). Between this and the completely brown shells are forms having varying amounts of the segments covered with brown, and arriving at a condition where only two white rays remain (Fig 3).



Sometimes the central segment will colour in completely, leaving white segments on either side of it (Fig 4), or there may be alternating brown and white segments (Fig 5).

On the above radial banding patterns we may now superimpose the infinite patterns of the zigzags. These latter may, of course, also be imposed on the plain white shell (Figs 7, 8 and 9).

Where the lines are fine and intricate and cross the concentric growth lines or grooves of the shell, a mottling effect is produced.

There will be many difficult-to-place exceptions, but the majority of specimens may fall into the above scheme.

Variation of animals and plants in nature is for many of us the most illuminating of biological studies. *Tawera spissa* provides an excellent opportunity for delving into its intricacies.

Editor's Note :

One of our Auckland members who arrived from England many, many years ago maintains she has never forgotten the surprise and delight of finding dozens of Tawera valves on Takapuna Beach. She was instantly reminded of the endless, intricate patterns woven in the blouses worn by Maori ladies in their traditional dress.

ANOTHER NOTE RE THE VANISHING TOHEROA

Norman Douglas
(Waiuku)

The New Zealand Herald (17 December 1982) contained a news item (shown below) directly relating to my article in Poirieria Vol 12 No 1. *

Northern Races May Be On Beach

A newly formed horse racing club is planning an eight-race meeting on a sandy stretch of Northland road next year.

Any horse will be able to run and any jockey will be allowed to ride.

About the only similarity with conventional race meetings will be that the riders will wear proper colours.

The plan to run the meeting along Ninety Mile Beach (which is legally designated as a road) has been approved by the Mangonui County Council.

The only hurdle now facing the 42-member Mangonui County Racing Club is the New Zealand Racing Conference, from which a licence for the meeting is being sought.

The secretary-treasurer of the club, Mr Andrew Rae, said the main purpose of the meeting was to give Northlanders interested in horses a chance to race them.

The club also hoped the meeting, planned for March 12, would be a winner with tourists.

The races, up to 1400 metres, would start near the Waipapakauri ramp and follow the natural turn of the beach to the south.

The running rail would be the tide.

"We used to have quite an active country circuit in the Far North and we are trying to resurrect it," said Mr Rae.

"It will be all amateur. A lot of people up here have horses about the place, but they never get the chance to race them."

The races will be sponsored, with the main event boasting a stake of "about $200."

This particular racing club meet was scheduled for Waipapakauri, but my local (Waiuku) west coast beach is the training ground for many racehorses and has been for many years.

It is doubtful if there is a day in the year when no training takes place on our local beach between Karioitahi (Waiuku Gap) and the river.

How many years does it take to grow a 4-inch toheroa? Under such circumstances, the answer must be - never !

* Toheroa - A Vanishing Morsus - Paphies (Mesodesma) Ventricosa (Gray 1843)

Editor's Note:
Since this article was drafted, the Ministry of Agriculture and Fisheries have placed a complete ban on collecting toheroas for the 1983 season

OTAGO SHELL CLUB TRIPS

Ailsa Cornelius
(Dunedin)

Late last year Otago Shell Club members spent a profitable Saturday morning at the Portobello Marine Research Station and aquarium. The aquarium tanks hold a wide variety of fish, sponges, crustacea, sea squirts, mollusca and many other phylla.

Among the molluscs may be mentioned octopus, nudibranchs, a range of shelled gastropods including deepwater forms, bivalves and a few chitons. The tanks are regularly replenished with new animals and showed on this trip one of New Zealand's largest crabs, *Leptomithrax australis*.

The habour shore showed live animals of :

Turbo smaragdus | *Zeacumantus subcarinatus*
Cellana radians | *Chione stutchburyi*
Notoacmea helmsi | *Paphies subtriangulata quoyi*
Maoricolpus roseus roseus

as well as numerous oysters and a colony of tiny shells tentatively identified as *Estea minor*. Some of the shell life in this area is discarded from the aquarium and not necessarily typical of the harbour.

Station staff on the "Munida" very kindly retained material dredged at 50m (in the course of research work) for a visiting Christchurch Shell Club member, Mrs Edythe Coursey, who spent the day with us. The sample yielded some interesting crabs, biscuit stars and a number of good shells.

Live molluscs noted were :

Emarginula striatula | *Alcithoe swainsoni*
Calliostoma selecta | *Alcithoe fusus fusus*
Thoristella chathamensis dunedinensis
Astrea heliotropium | *Modiolus areolatus*
Maoricolpus roseus roseus | *Chlamys gemmulata*
Sigapatella novaezelandiae | *Chlamys dieffenbachi*
Xymene convexus | *Cardita aoteana*
Glaphyrina vulpicolor | *Dosina zelandica*
Ostrea charlottae | *Hiatella arctica*

and many smaller shells and chitons yet to be identified.

Dry shells included :

Zeacolpus symmetricus	*Divaricella huttoniana*
Zegalerus tenuis	*Venericardia purpurata*
Austrofusus glans	*Nemocardium pulchellum*
Cylichnina striata	*Notocallista multistriata*
Nucula nitidula	*Tawera marionae*
Nucula hartvigiana	*Myadora novaezelandiae*
Atrina zelandica	*Myadora subrostrata*
Limatula maoria	*Borniola reniformis*
Pleuromeris marshalli	*Tugali elegans*
Pleuromeris zelandica	*Tugali stewartiana* ?

We found this selection small when compared with that of earlier trawls down to 400m.

Before leaving the station, members fossicked the 'midden' of discarded sortings of bottom-trawled material resulting from routine work on the Otago shelf. Good specimens included many mentioned above and also :

Tugali elegans	*Calliostoma selecta* ?
Struthiolaria papulos (gigas)	*Chlamys delicatula*
Maoricrypta monoxyla	*Chlamys dichroa*
Tanea zelandica	*Chlamys dieffenbachi*
Cominella nassoides nassoides	*Chlamys gemmulata*
Cominella sp.	*Chlamys taiaroa*
Xymene ambiguus	*Mesopeplum convexum*
Buccinulum pertinax finlayi	*Escalima regularis*
Glaphyrina vulpicolor	*Lima colorata zelandica*
Glycymeris laticostata	*Diplodonta globus*
Cuna carditelloides	*Longimactra elongata*
Corbula zelandica	*Plurigens phenax*

Panopea smithae

The trip ended with a worse than usual rain squall and biting winds, but not before Club members were rejoicing over finds and pails of spoil to sort.

The second field trip for October was to Second Beach (immediately south-west of the western-most reach of St Clair beach, Dunedin). The day was fine, with a cold breeze and a low barometer, and a heavy sea that more than offset an otherwise good spring low tide in an area that provided both Finlay and Oliver with a number of species to describe. Members were undeterred and, with their visitor (Mrs Coursey), took to the exposed boulder beach with its inter- and sub-tidal basalt reefs in pursuit of topotypes, particularly *Notoacmea badia.*

Two small boys, their curiosity excited by the unusual height of activity on their beach, asked our quest and, when informed, casually tossed to Mrs Coursey a live and perfect *Modelia granosus,* something of a local rarity.

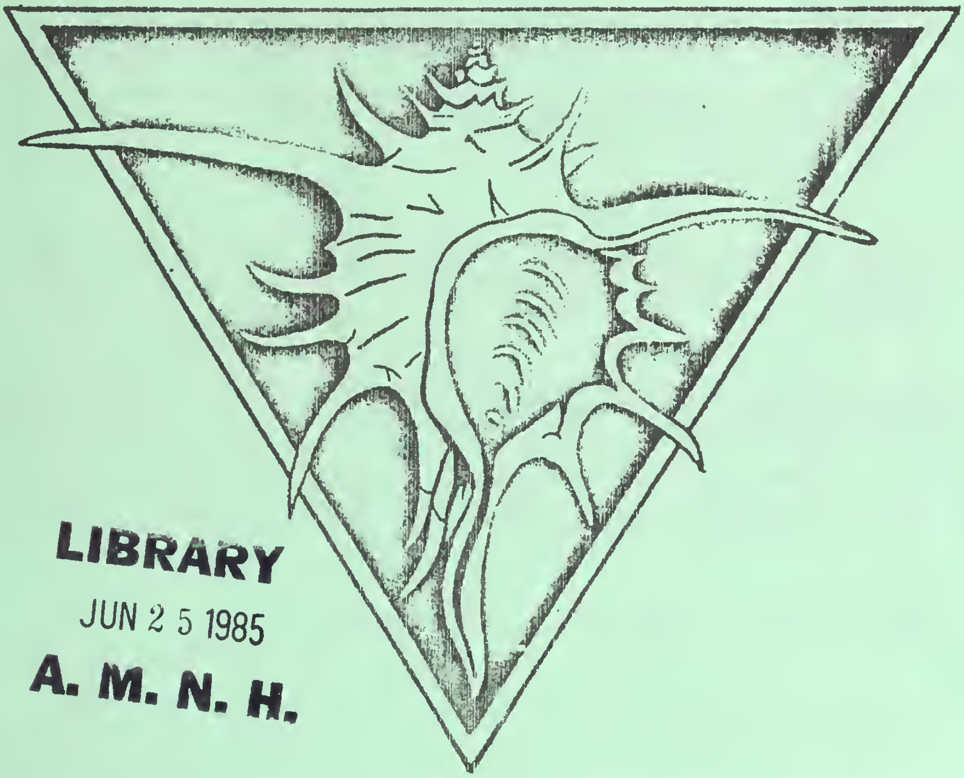
Live animals included :

Cellana radians	*Siphonaria australis*
Notoacmea badia	*Siphonaria cookiana*
Notoacmea parviconoidea	*Siphonaria zelandica*
Notoacmea helmsi	*Benhamina obliquata*
Patelloida corticata	*Lasaea rubra hinemoa*
Margarella antipoda	*Gaimardia forsteriana forsteriana*
Buccinulum vittatum littorinoides	*Gadinalea conica*

Questions arising as to which animal lays what spawn mass may in part be answered by tank studies, it being intended by one of our members to keep a tank for nudibranch observation.

A further trip to this beach is planned for later this year when favourable tides return. It is hoped to make a more detailed list of species to be found there.

POIRIERIA



Auckland Museum
Conchology Section

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C O N T E N T S

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EDITORIAL

This issue of Poirieria, the first since November, 1983, sees a number of changes. Firstly we have had to change our format to a less expensive form of publication to keep the cost of publication in line with club funds. Secondly I have taken over the job of editor from Derek Lamb, although most of the work done in preparing this issue for publication was done by him.

I wish, on behalf of the club, to thank Derek for his years as editor. He had the unenviable job of taking over from The Gardners, yet managed to bring his own style to the magazine. His professionalism is perhaps best demonstrated by the issue on land snails with its high quality prints.

The main reason for the time gap since the last issue was published was the lack of contributions from members. We cannot publish an issue until we have enough material, so get writing! In particular, I would like to receive articles about the living animals that inhabit shells - where they live, what they feed on, how they live, etc. The need for this is ably demonstrated by Normal Douglas's cartoon in this issue on the decimation of toheroa beds. I would also like to receive articles on the shells found at different localities and the relative abundance of each species. This information would be gratefully received by other members who are perhaps planning to holiday in the same area. I look forward to your contributions!

Ian Scott
25 Halston Road
Auckland 4

Editor

PRELIMINARY REPORT ON THE ARRIVAL OF A NEW MUSSEL AT AUCKLAND, NEW ZEALAND.

Dr. Richard Willan, 1985.

Throughout the last decade we have witnessed the explosive colonization by foreign molluscs of the New Zealand coastline. Strangely all have been bi-valves: Theora lubrica, Limaria orientalis, Crassostrea gigas. And now the establishment of another can be reported - the mussel Musculista senhousia. Surveys I conducted this summer (December 1984 and January 1985) show the mussel to be locally common in Auckland on the beaches of Tamaki Strait and the Waitemata Harbour. The present extent of its New Zealand distribution needs further study.

Musculista senhousia (Benson 1842) is an Asian mussel naturally occurring in the western Pacific (China, Japan, Hong Kong). It can reach 25 mm in length. One immediately recognizes some features that seperate it from Xenostrobus pulex and Modiolarca impacta, the similar-sized mytilids that occur with it. M. senhousia is elongate, its shell is richly marked on the outside with reddish-brown undulations, there are thin radial lines on the flaring posterior end and fresh shells have a smooth, translucent, olive-green periostracum. On the inside, the shell has a vivid pearly lustre and attractive series of wavy lines that are never identical in any two specimens. More subtle distinguishing characters are the presence of minute teeth anteriorly just below the umbo and along the dorsal margin. The shell is completely smooth apart from some rather indistinct radial lines at the very front end in most specimens; these lines are best seen in fresh specimens in which the periostracum is still intact. Being so attractive and distinctive, Musculista senhousia deserves a common name like Zebra Mussel or Fingerprint Mussel.

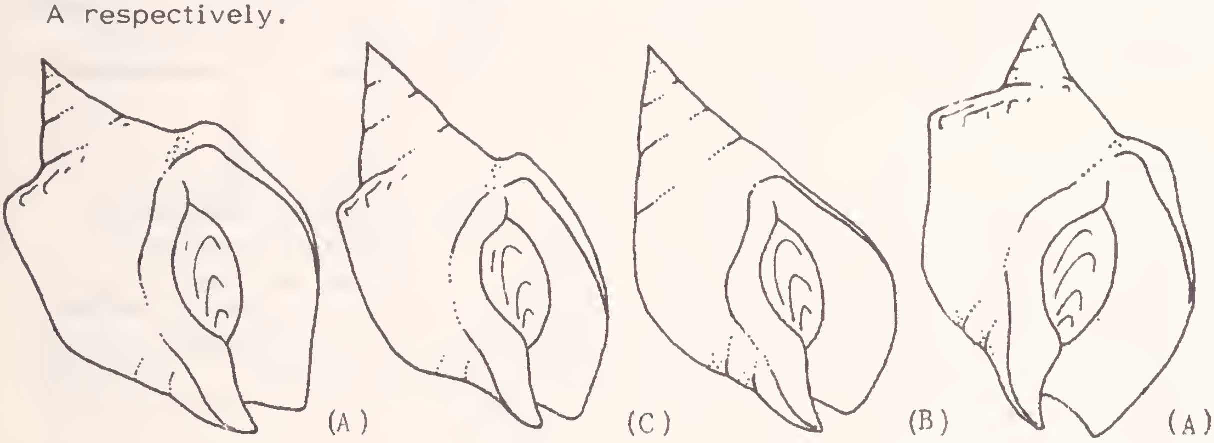
I will publish a comprehensive paper on this new arrival in the Records of the Auckland Institute and Museum later this year. It will contain a full description together with quantitative data and ideas on its first arrival in New Zealand. Because people will want to find Musculista senhousia themselves and can do a great service by documenting its spread, I can indicate what habitats to find it in. First choose a partially protected part of the coastline, then look for empty valves of this mussel in mid-tidal pools. Musculista lives at that level amongst clusters of Xenostrobus pulex and turf of Corallina algae. However, unlike the ubiquitous Xenostrobus, Musculista shuns too exposed or too sheltered shores. It imbeds itself vertically, attaching by a rather fine cluster of byssal threads so only the posterior shell margins and black siphons are visible at the surface.

The pleasure at the discovery of this pretty addition to our molluscan fauna must now be tempered with some concern. What if - as has happened in North America - a foreign predatory gastropod such as an Oyster Drill was to become established in New Zealand? In addition it is probable that these foreign colonising molluscs will be competing with our indigenous New Zealand species for food and space and the original inhabitants will come off second-best if the situation on land can be used as a guide.

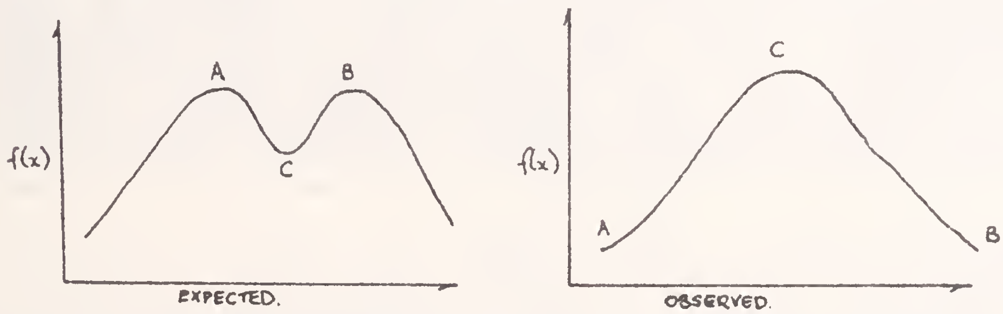
VARIATION IN SHELL SHAPE IN COMINELLA ADSPERSA (BRUGUIERE, 1789)

Steve O'Shea
December 1984

While walking along a muddy estuary between Kawakawa Bay and Maraetai, Hauraki Gulf, I was intrigued at the degree of shell shape variation present within the population of Cominella adspersa at this locality. Specimens exhibiting massive shoulders and those exhibiting normal shoulderation were both very numerous. My first impression was that there was some genetic relationship determining as to whether a specimen developed a massive shoulder or the shoulder typical of "normal" C.adspersa. I intended to take the height/width ratio of a large sample of individuals (approximately 200 specimens) to determine as to whether the two morphs of extreme shouldered and normal shoulder calcification were any more prolific in the population than those of other morph shapes. I was expecting, if this were the case, a graph showing two definite peaks, that of bimodal distribution, with one peak representing a high h/w ratio, those individuals with normal shoulderation, and one peak being a lower h/w ratio, those massively shouldered individuals, B and A respectively.



However I obtained no such results, the exact opposite was found to be the case with A and B being the least prolific and the intermediate degree of shoulder calcification was the most common. The individuals represented by C were proportionately the most abundant.



The fact that no such bimodal distribution pattern was obtained discounts both sexual dimorphism, where male and female are morphologically different as in some Lambis and Cassis, and advantageous morph designs within the population, i.e. when particular morphs of a shell are better adapted to a particular environment than other morph variations. If the latter of the two examples were the case and the extreme shouldered

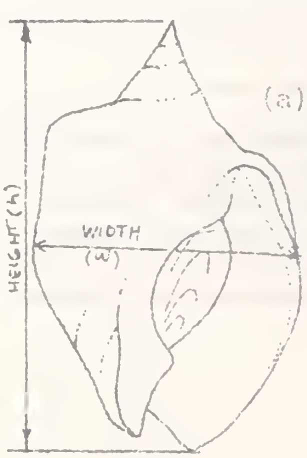
and "normal" shouldered morphs were advantageous to the individual you would have expected proportionately more of the extreme specimens than those of the intermediates, this obviously was not the case.

Because of the discrepancies observed in the above two cases from that expected, if they in fact were the case, I tentatively discarded those proposals in search of some more idealistic explanation. The actual results obtained are illustrated on Graph No. 1. Both live and dead specimens were collected indiscriminately so that there was no preventable bias in my collecting technique ensuring a reasonably accurate representation of the whole population from my sample. The live and dead individuals were sorted out into those categories, individually measured and graphed. One might assume and compare the graph shape illustrated as that of normal variation within a population and such an assumption would be true in many circumstances, cf. Human height variation where the majority of individuals in a population are intermediate in height. In this instance the points labelled A and B would be population dwarfs and giants respectively. In the case of C.adspersa these points A and B would represent the two most abnormal specimens in relation to all other specimens, the most non-shouldered and shouldered individuals respectively. It may seem acceptable that the majority of individuals be intermediate in morph characteristics, as in human height variation in a population. However, although I cannot prove that what is happening here is not just a simple case of variation within a population, I propose two arguments reasoning that this is so. I also admit that everything written so far to get to this is based upon speculations and assumptions.

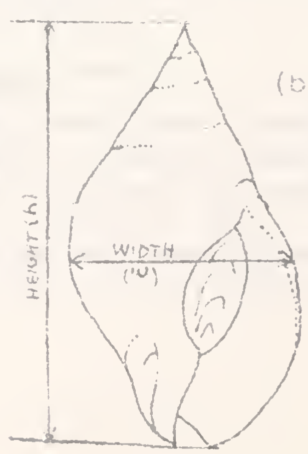
Argument 1

This type of variation, present in humans as in most populations of a great deal of species, impresses that those individuals represented by points A and B are the least common type of individual expressing a particular type of morph varying the greatest from the average type of individual or character within that population. In humans where the height was the variable being expressed as already stated those individuals would be the dwarfs and the giants in that population. This type of variation would be satisfactory for C.adspersa if it were not for two factors.

(i) Points A and B, in C.adspersa, do not both represent morph extremes in the same manner as that above, even though they are the least common morph varients encountered within that population. Specimens of h/w ratio represented by the point B are specimens exhibiting normal shoulder calcification typical of most normally encountered specimens around New Zealand's shores; in fact these specimens are identifiable as of being totally normal specimens. Those specimens ranging from B to A exhibit a gradual increase in shoulder calcification abnormality away from the typical characteristics of morph type B.



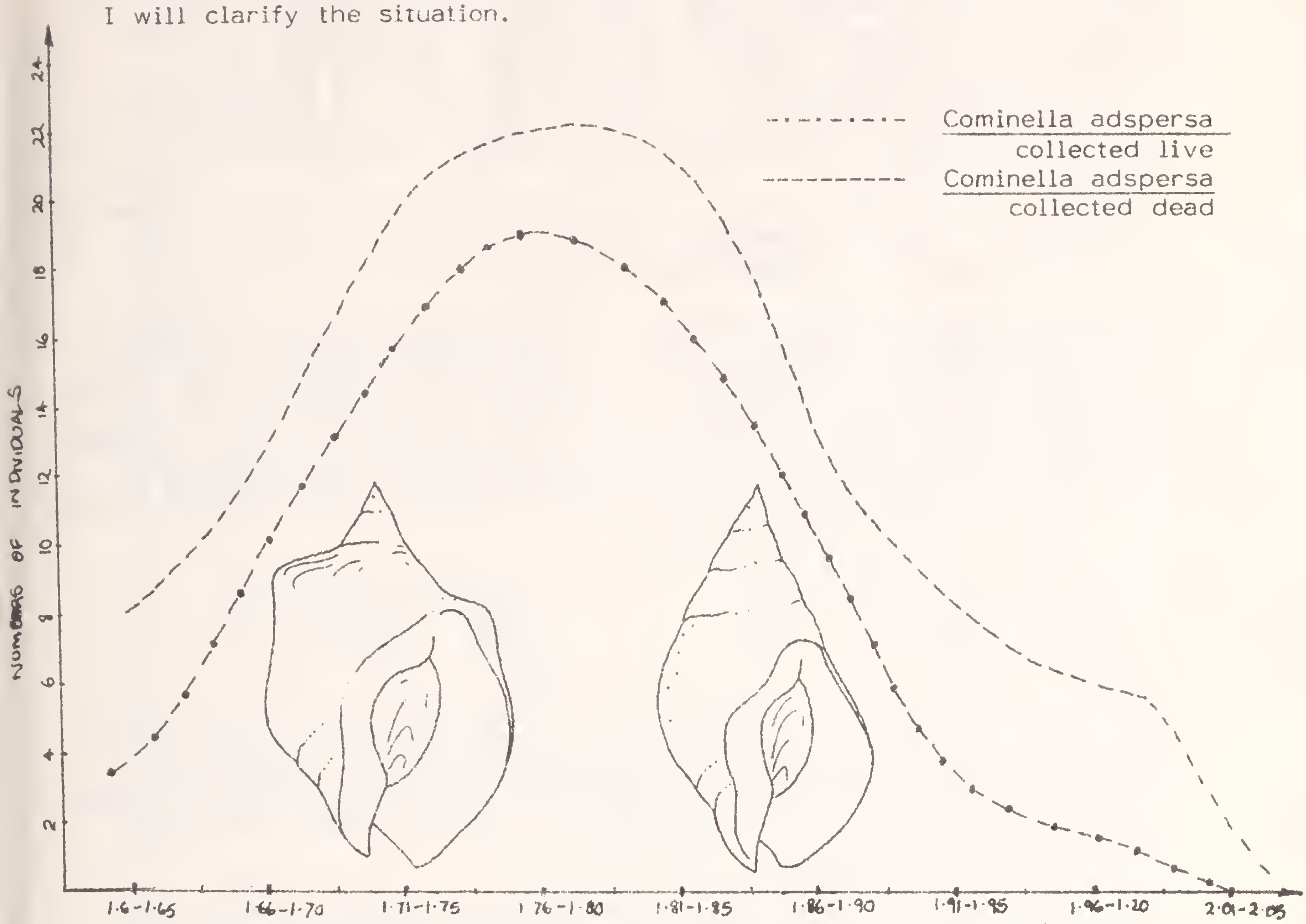
(a)
Height= 5·7
Width= 3·6
h/w= 1·6



(b)
Height= 5·6
Width= 3·0
h/w= 1·9

Obviously (b)'s h/w ratio is greater than that of (a).

I believe that this ratio business may get confusing so here and now I will clarify the situation.



Ratio of Spire Height/Body Whorl Width (mm)

Numbers of Specimens Placed Into Appropriate Ratio Groups

If the relationship to which I had referred had been of a simple genetic basis, as in sexual dimorphism or advantageous morphs, you would, as I did, expect a graph showing two definite peaks. (This would mean that the two types of individuals present within the population, those of heavy shoulder and normal shoulder, were more prolific. If males grew heavy shoulders and females grew the light shoulder you would have expected individuals to be either one or the other. This was not observed so this theory can be discounted.)

If the heavy shoulder and the lighter type of shoulder were of some advantage to an individual you would expect their chances of survival to be greater than those of other morph variations. This also was not evident as the individuals of intermediate shoulderation were far more prolific. Because of this I tentatively discard this theory as well.

As neither of the above two cases appeared to be responsible for the variation evident within the population I had to search for some "better fitting" explanation.

I graphed my results obtained from the two categories separately to determine as to whether the type of variation present had been constant over a number of generation(s). That the morph distribution found in the number of dead specimens almost identically matched that found in the live specimens, supports the data used, enabling me to make better-founded assumptions and makes me feel good. It enables me to say that the problem is widespread and probably is of a long-term nature with respect to the continuity witnessed in past generation.

With all this in mind I progress on to the next theory as to the cause of shoulder massivity found in a number of locations, from as far as I can determine, New Zealand wide.

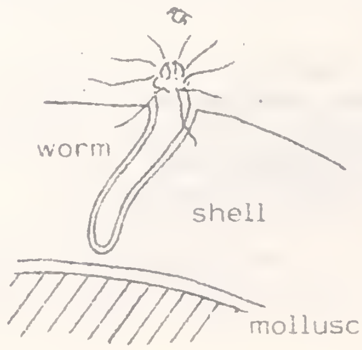
The specimens illustrated overleaf show that the individuals exhibiting massive shoulderation have a h/w ratio relatively smaller to that of the non-shouldered individuals. This means that the smaller h/w ratios are going to be placed towards the left-hand side of the graph, these points corresponding to the individuals with excessive shoulder calcification - for ease labelled A. The individuals with a relatively higher h/w ratio, those "normally" shouldered individuals, are positioned towards the right-hand side of the graph.

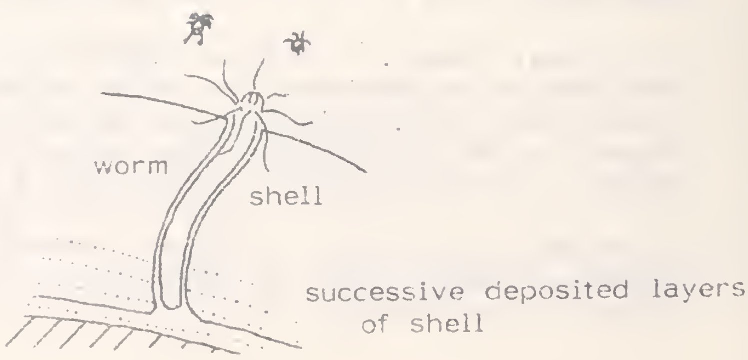
- non-shouldered individual
- height = 62mm
- width = 31mm
- h/w = 2.0

- shouldered individual
- height = 62mm
- width = 41mm
- h/w = 1.5

With this cleared up I resume to say that the majority of individuals, I believe, have reacted to some environmental influence resulting in the production of large heavy shoulders, with a few individuals reacting to an excessive extent promoting massive shoulder calcium deposition, those individuals C and B respectively.

... and Factor (ii) which also turns out to be Argument 2 (I'm only human). Closer inspection of the specimens reveals that those individuals endowed with shoulders ranging between individuals B to A, i.e. from slight shoulder abnormal formation to those individuals with massive shoulders of extreme abnormality, had shells infested with a particular species of worm. A general relationship was also obvious between degree of infestation and magnitude of shoulder calcification. It was found 96% of all non-shouldered individuals showed no traces of worm infestation. Alternatively 93% of all shouldered individuals showed obvious signs of worm infestation within their shells. This is reasonably decisive evidence implying that excessive shoulder calcification is due to the irritational effects of worms burrowing into the body chambers of the mollusc causing calcium deposition to alleviate that irritation.





The worms I have been told are parasitic upon the shell and not the individual, present only for the surface in which to live. In general the end internal within the structure of the shell secretes an acid solution that dissolves the calcium carbonate of which the shell is composed enabling body extension of the worm as growth proceeds. Eventually the posterior end of the worm penetrates the body chamber of the individual's shell. This penetration of the worm is extremely irritational to the body mantle of the individual and the individual responds in a manner to alleviate that irritation. Each individual is distinctly separate from all others in that population, and responds in a manner most suitable to its own personal requirements. However, distinct parallels between all specimens can be drawn and the most obvious of these is the secretion of further layers of shelly material over those areas of infestatory penetration. This continuous secretory behaviour of the body mantle in response to continued worm infestation and penetration eventuates in grossly thick regions of the shell in the close proximity of areas of worm attack. This heavy calcification of internal body chamber walls, suture and inner columellar, cause a marked decrease in available body chamber volume. Consequently, were the shell of mature and non-adjustable size the animal would be pushed out.

Figure 1 illustrates a life-size specimen of C.adspersa that is 71mm long, from between Kawakawa Bay and Maraetai, as are all these specimens unless otherwise stated. This specimen has an evenly convex periphery and of a very lightly built character, bar the last half of the body whorl where considerable thickening of the shoulder is evident. This may suggest that maturity of the individual results in gross aperatural thickening as is evident in many species of mollusc. However to make things even more difficult I propose four arguments that make me feel that this also not be the case:

(i) Only that area in the proximity of the posterior anal canal, that area associated with the suture of fusion between the newly formed body whorl and that of the previous body whorl is thickened, the remainder of the lip maintaining a relative uniform thickness. This argument is applicable to every specimen collected from this, and I stress this, locality.

(ii) The area where the thickening of this sutural region begins is an area where recently extreme worm sutural attack is evident. The apparent time lapse between the infestation and obvious mantle response is easily explained as follows. The specimen in question is attacked at the suture of the latest and previous body whorls behind the lip. Attack at the suture was the most common form of attack as this area represents a point of obvious weakness, a fault line in the structure of the shell. The worm commences its burrowing activities and the individual its normal growing pattern. Penetration of the body chamber by the worm then occurs. In this period of time the specimen in question may have added "x"cm of shell to its outer lip. As already stated, penetration results in secretion, and secretion results in grossly thickened and abnormal shoulders due to suture penetration and suture secretion, the suture being that region of the shoulder where preferential attack by the worms is evident. Therefore you would expect, and this has been observed, a time lag between the arrival of the worms, the consequent penetration of the worms and the development of the heavy shoulder ridge "x"cm away from the original area of worm establishment.

(iii) Specimens of all degrees of maturity are found with this heavy sutural thickening and all have obvious signs of worm establishment

and penetration within their shells. Also specimens exhibiting no shoulder calcification abnormalities of all degrees of maturity are found and these invariably show no traces of worm establishment upon or within their shells.

(iv) The fact that a number of large and obviously old and mature specimens show no degree of sutural abnormal calcium deposition discounts that it is an age maturity factor responsible for the massive deposition evident in other specimens.

Figure 2 is that of a typical specimen from this locality, the two dimensional view of the shell does no justice to the actual degree of abnormality present. Sectioning, using a grinding machine, reveals the actual extent of the sutural thickening and also exposes the terrific amount of worm infestation within the successive layers of calcium carbonate laid down by the individual to alleviate the irritational penetration. The correlation of areas of extreme worm infestation and extreme shoulder calcification are so constant that I could not help but be impressed with the growing amount of evidence substantiating my claim that worms cause the heavy shoulders observed in so many specimens. Sectioning of the shell by grinding of the earlier body whorls reveals the true extent of the body chamber volume decrease. The successive rings of carbonate deposition (very similar to growth rings seen on tree sections) are very obvious, as is their effect on the available body chamber space available to the individual. To maintain comfort within the shell the columellar muscles must be capable of (i) relaxing their "grip" upon the columellar to permit body movement "down" through the shell such that constriction of the visceral mass and other organs and tissues does not occur by the enclosing body chamber walls, or (ii) elongating their body inside the constricting walls such that distribution of the individual's body is over a greater distance, a longer narrower body results. I have reason to believe that the second of the above occurs.

Figure 3 is that of the normally encountered C.adspersa, x1. A number of specimens of this type were found in the sample. However, proportionately they were few. No traces of worm infestation and no traces of excessive shoulderation are present in any of these types of specimens (represented on the graph as individuals B). The specimens are lightly built and have smooth, convex peripheries. When sectioned in the same manner as those individuals in fig.2 they show neither the heavy sutural deposition or the successive layers of carbonate restricting the body chamber volume.

If two specimens of the same height were compared, one individual similar to that in fig.2 and the other of fig.3, it would be found that the volume of those non-shouldered individuals was far greater than the volume of the shouldered individuals, and although I found no evidence of this I would assume that the non-shouldered individuals would live a longer, healthier life.

The specimen illustrated in Figure 4 further supports my belief that worm infestation is the primary factor involved in shoulder calcification. This specimen exhibits changes in shell structure with respect to different degrees of worm infestment found in different regions of the shell. Side A has minimal worm infestment and few extra layers of carbonate deposited. It also has a very slight shoulder. Side B however has very heavy infestment of worms within the shell and as would be predicted has many extra layers of carbonate deposited resulting in the

heavy shoulder observed. That one area of a shell can have comparatively slight calcification and another extremely heavy calcification implies that the response is a localised one with areas of the body mantle working independently of one another to alleviate localised regions of penetration.

Figure 5 just shows another specimen from this locality exhibiting a massive shoulder with massive establishment of worms both visible upon the outer surface of the shell and within the aperture under the last layer of carbonate deposited by the mantle.

Figure 6 is a specimen collected from Bland Bay, about 35km south of Russell. This specimen exhibited an extremely unusual morph that was very globose, depressed spire and on my first impression extremely few traces of worm presence. In utter despair I ground into the specimen only to find what I had originally expected, with one exception. Here the worms were quantitatively distributed down the columellar and this had resulted in the excessive layers of carbonate being deposited in that region. That two specimens geologically separated by nearly 200km of coastline can be afflicted by the same type of deformity caused through worm infestation, and predicted to be the case although at first not blatantly obvious, helps very much to substantiate my claim. A number of other specimens from this locality also exhibited this same worm infestation and shell deformation.

Figure 7 illustrates some of the many dead specimens of which were collected between Kawakawa Bay and Maraetai. One factor that nearly every one of these specimens shared in common was their massive degree of worm infestation present within the apertures. Nearly every specimen collected dead was heavily to very heavily shouldered bar one or two individuals with no shoulder excess, that interestingly enough lacked all traces of worm penetration within their shells. Those specimens exhibiting the greatest degree of worm infestation within the aperture generally exhibited the greatest shoulder calcification. Another factor quite noticeable was the range of sizes of dead individuals present that had the heavy shoulder calcification. In general it appeared that the specimens of the smaller sizes with heavy shoulders also had great worm infestation within their apertures. I therefore propose that worm infestation is also a major population number restricting agent. Those individuals affected to the greatest degree by worm infestation have the somewhat biased chances of premature mortality.

I have at this stage looked at many specimens from many localities from as far south as Mount Maunganui to the Bay of Islands and found invariably that those specimens exhibiting these massive shoulders were to some degree infested with worms. I was at this stage 100% positive that I had discovered the cause of this shoulder massivity as of being influenced by the irritational effects of the worms, when it was brought to my notice a population of C.adspersa that contradicted my hypothesis. These specimens found at Wattle Bay in the Manukau Harbour show no less than extreme shoulderation but lacking any traces of worm infestation. It amazes me that exactly opposite this location at Cornwallis in the same harbour I observed shouldered specimens obeying my every statement as if it were gospel.

This somewhat shattered my confidence in what I had to say. However, I am sufficiently satisfied with what I have shown to remain convinced as to the causes of shoulder massivity in this species.

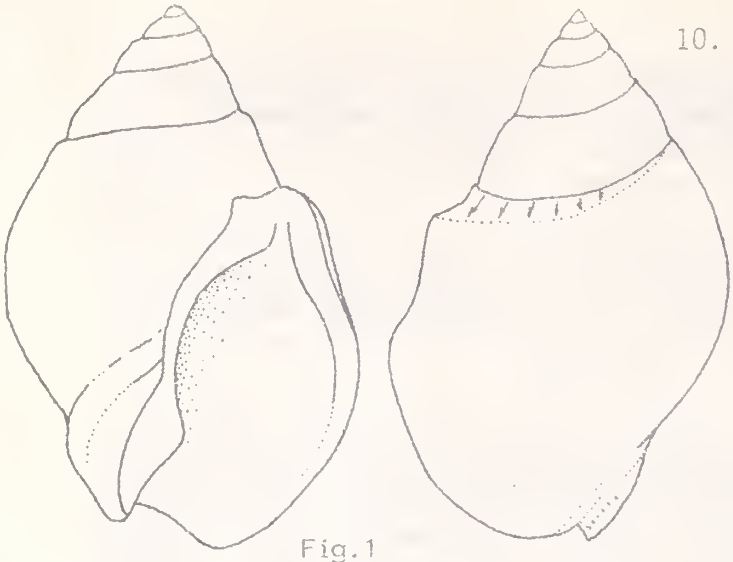


Fig.1

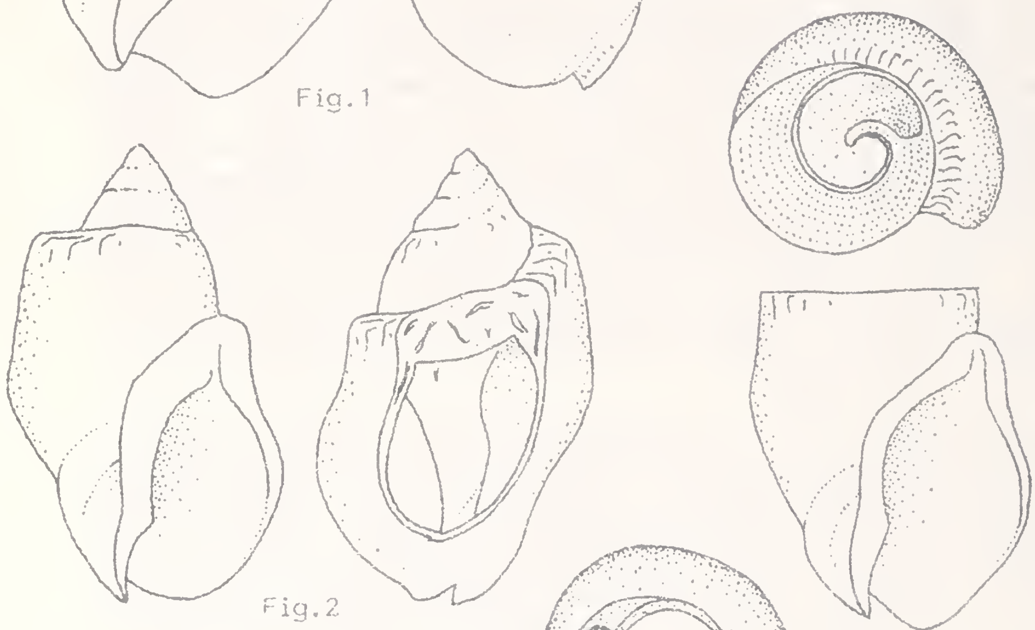


Fig.2

Fig.2 and fig.3 are the two morph extremes found in this population.

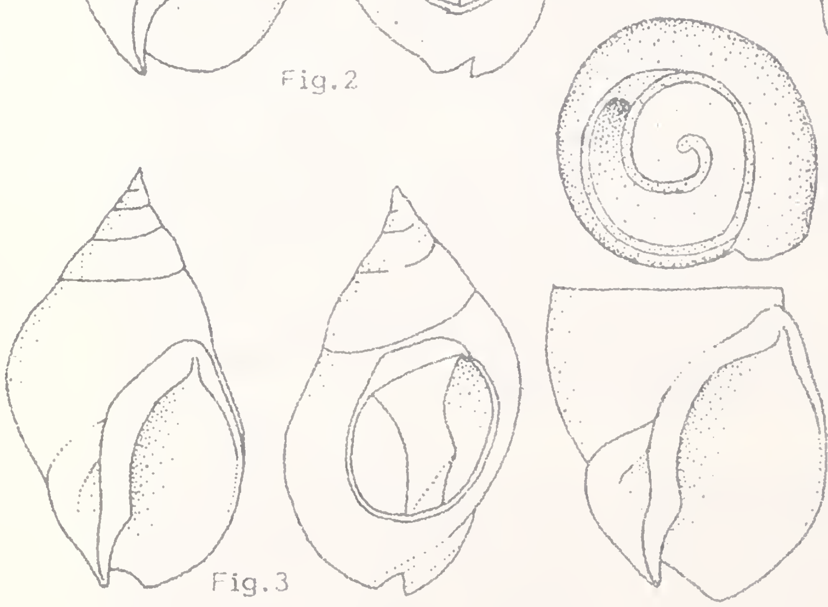
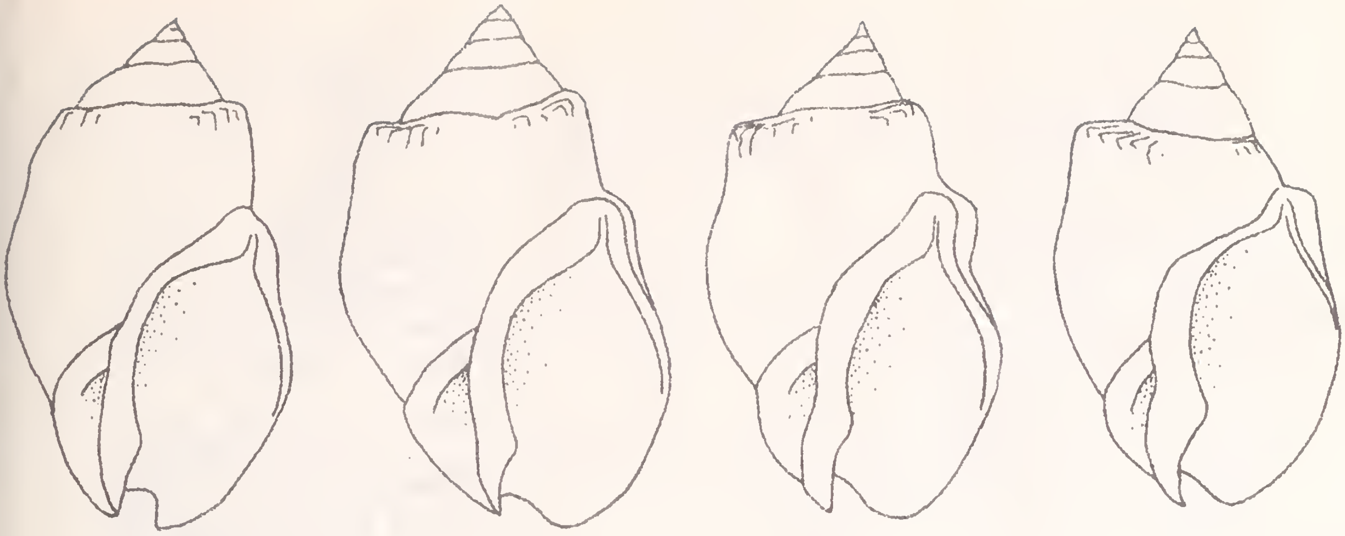


Fig.3

Individuals chosen to represent morph types and varieties found within the population of C.adspersa at the locality between Kawakawa Bay and Maraetai.

Basically the difference in morph types at this locality was some specimens exhibited immense shoulders, huge body whorls and a generally elongated appearance to the shell while other specimens (that of fig.3) exhibited none of these features. The specimens exhibited in fig.3 are those that most people would refer to as normally encountered specimens.



Figures 7 (1-4)

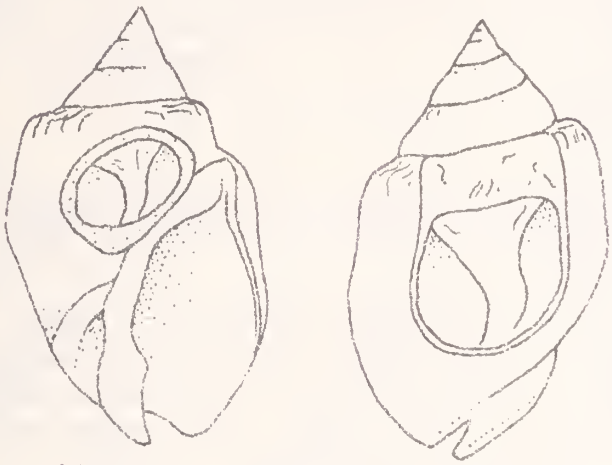


Figure 4

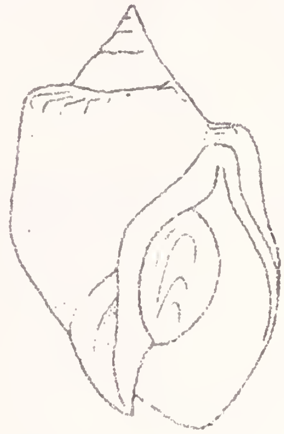


Figure 5

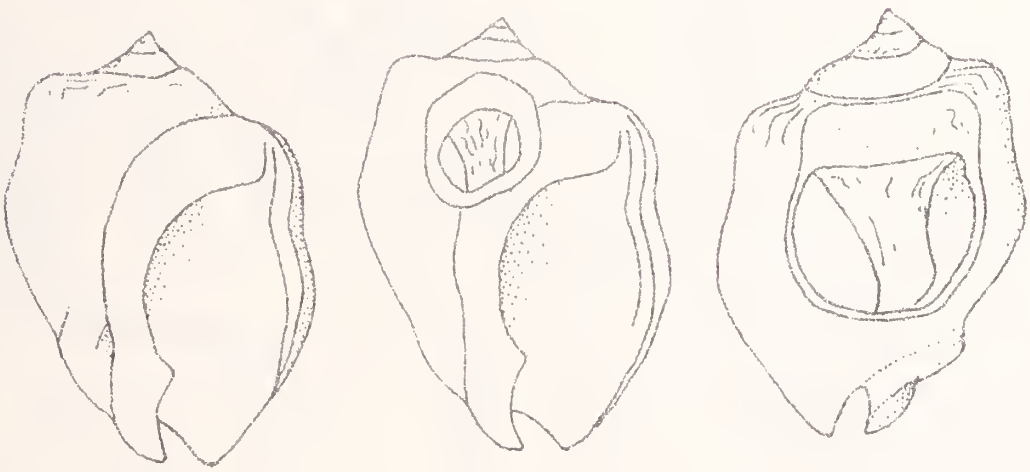
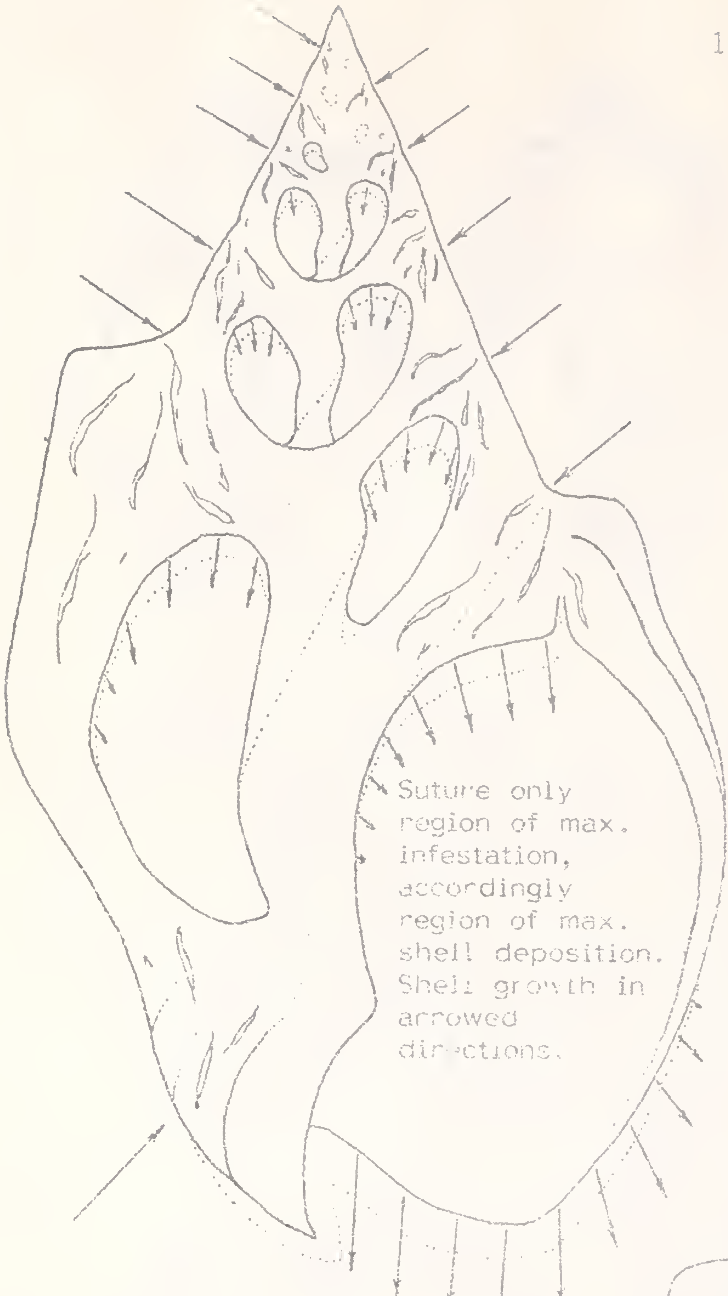
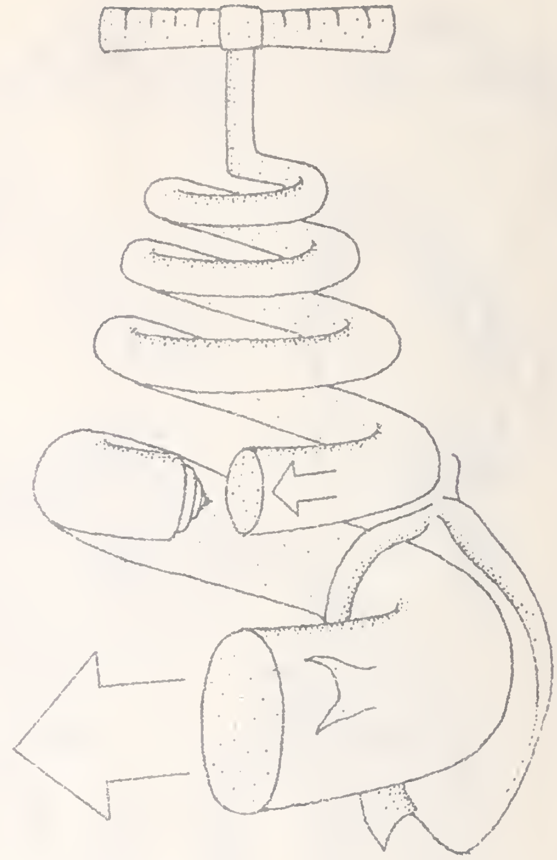


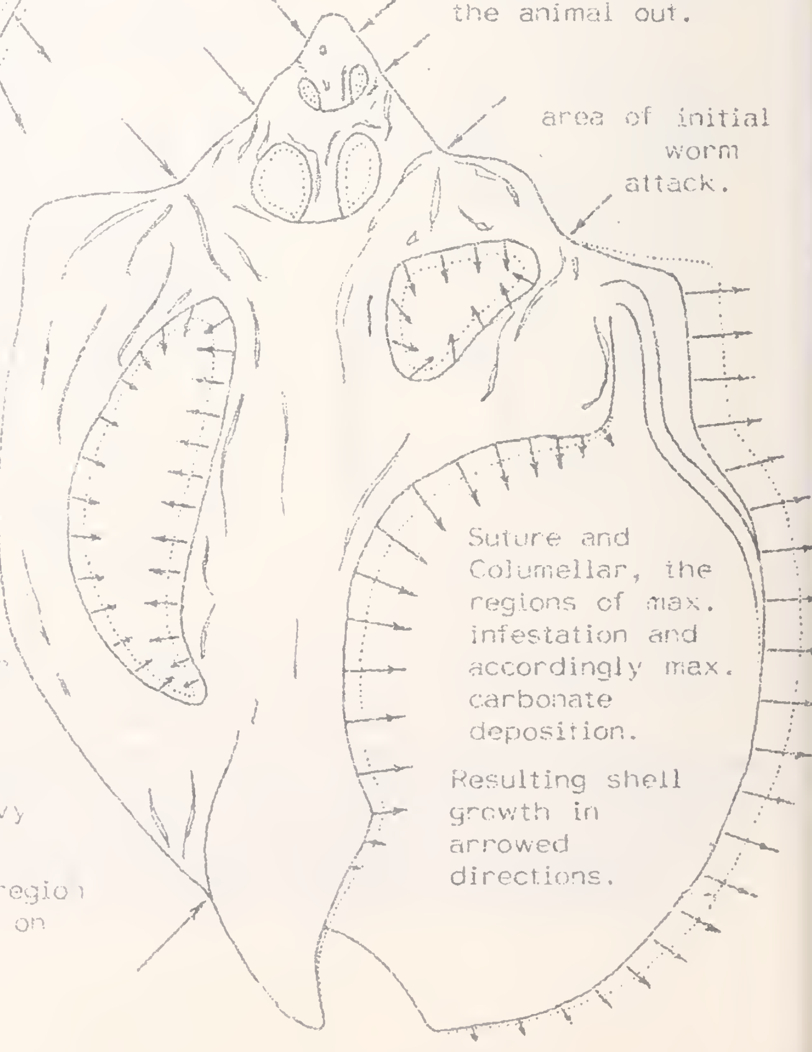
Figure 6

This specimen illustrated in Figure 6 is of particular interest as it exhibits the extreme in morph shape with relation to shell globosity. That this specimen was particularly infested down the columellar and showed this unusual degree of globosity resulted in diagram 8 and the postulation of the idea that the shape of the individual was dependent upon the degree and distribution of the worms within the shell of the individual.





Diagramatic expulsion of the individual with shell deposition internally forcing the animal out.



These three illustrations are an attempt to produce a reasonable theory as to the cause of the different types of morph shape observed at this locality.

What I have tried to show is that the shape of the individual depends upon the degree of worm infestation and the areas that the worm has inhabited rather than a genetic relationship, that the degree of shoulder massivity does not depend directly upon the chromosomes held within the cells of the individual in question.

Extensive infestation down the inner columellar results in short spired, heavy and globose specimens.

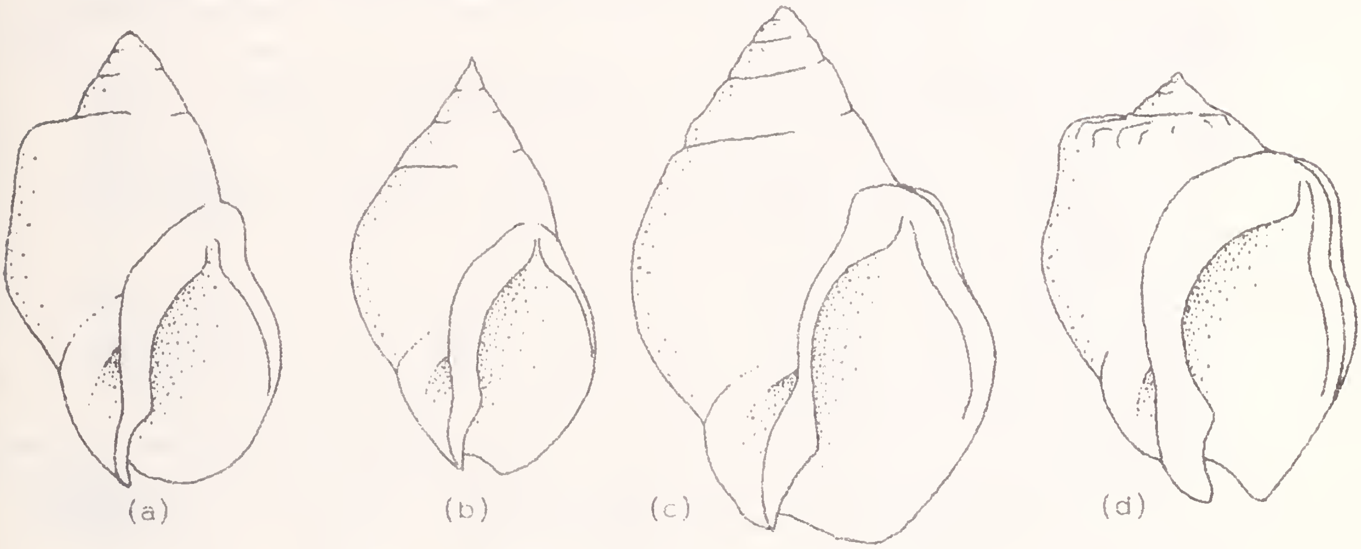
Extensive infestation down the sutural region results in tall spired, heavy shoulders on specimens.

I look forward to any correspondence from readers expressing their own views on this matter, as I feel any further information on this subject can only be of benefit to everybody.

I have taken the liberty of enclosing 3 drawings illustrating the different types of morph that I have observed. I would much appreciate it if you could examine your specimens to determine as to whether they show traces of worm infestation accompanied by shoulder massivity, no traces of worm and no shoulder abnormality, or something intermediate.

...as of the Wattle Bay specimens, I assume or hope some other factor irritational to the body mantle is applicable, or are they some super-breed sent forth from outer space to destroy my theory. Personally I favour the second theory. Whatever the case, they exist and there is nothing else I can do but say they exist.
... one final fact that supports this theory is the production of the pearl. The parallel can most certainly be drawn - irritation and secretion.

Could you please include as to whether these specimens were found in an open or sheltered situation. Harbour = sheltered ,...



(a) (b) (c) (d)

(e)-something else (?)

TEACH YOURSELF CONCHOLOGY

OR

TAKING THE HELL OUT OF SHELL.

Kon Hepers 1984.

The new shell-collector or shell club member is often overawed by the erudition of the experts, amazed by their self-professed profundity of knowledge on the subject of conchology and envious of those fabulous finds of former years, recounted in reminiscences liberally laced with Latin names. The following observations on some practical aspects of shell collecting are given to assist the beginner in quickly attaining expert status.

1. All shell species prefer a particular habitat which varies only with the area being searched and the expert being consulted.

For example, after spending futile hours wading on tidal flats seeking Alcithoe arabica, it is not unusual to meet a man who has just collected a sack-full of this species on a nearby rocky reef. This man registers surprise when scornfully informed that the species is a well-known sand-dweller.

Of course next time one secretly disregards the experts and spends futile hours picking over that rocky reef - again looking for Alcithoe arabica. It is almost certain that one then meets the same man who, heeding one's earlier advice, has just collected another sack-full while wading on tidal flats.

2. During daylight, the experts say, shells hide beneath rocks.

This writer's survey of rocks on any given reef at low tide yielded the following data:-

(a) Small rocks can conceal one or two very small, very common shells.
(b) Medium rocks can conceal three or four very small, very common shells.
(c) Large rocks can conceal up to five or six very small, very common shells.
(d) 95% of small, medium or large rocks conceal no shells whatsoever.

Therefore, when collecting very small, very common shells it is self-evident that time and energy can be conserved by turning over only the remaining productive 5% of rocks, ideally the large ones for bulk collections.

3. It is especially important to overcome one's frustration after turning over a hundred and one barren rocks sufficiently to replace every single one exactly in its original position.

This ensures that any following collector cannot perceive that the rock has already been lifted and thus equally wastes his time searching beneath it without gaining any advantage.

If such simple rules of reef-etiquette are observed more pleasure can be derived from shelling.

4. Experts agree that shells always come out to feed at night and can best be collected or studied at that time. This is so except during night shell-collecting outings when the molluscs are indeed noticeable - - by their absence.

So are the experts.

The beginner assumes that both parties are resting-up after heavy diurnal feeding. The fable obviously originated from the scarcity of shells in the daytime.

The nocturnal shell-collecting nature-lover is rewarded nevertheless with the opportunity to stroll upon wall-to-wall carpet of barnacles, to provide refuge under his feet for hysterical dislodged crabs and rock fish, to act

as blood donor for hosts of sea-lice and sandflies and to witness the self-immolation of countless tiny insects on the flame of his benzene lamp.

5. Many shells are very well camouflaged and are easily passed over as pieces of debris. The amateur collector, however, finds himself adequately compensated by picking up many pieces of debris disguised as shells.

6. When collecting in the tropics you are warned by experts that it is well to remember that several species of cones are quite poisonous. Fortunately these are readily identified by the onset of constant vomiting, extreme agony and almost certain death when stung or bitten. This means of identification is deemed more scientific than a purely visual one, as eyesight is one of the functions severely affected by the venom.
Such cones should be returned to the water immediately after positive identification.

7. Some experts hunt shells by following their tracks on the sand but the beginner who finds an obvious track and digs at either or both ends is apt to be disappointed.
The writer's own study has shown that all such tracks are laid by a molluscan adaptation of ventriloquism.
Hence it is much more profitable to dig in areas where tracks are non-existant.
When tracking underwater it is often advantageous to obscure fellow divers' vision by stirring up as much silt as possible with vigorous flipper strokes. This technique requires very little practice.

8. The novice shell-collector tends to over-burden himself with hardware when venturing upon the reef. Such items as gloves, tongs, tweezers, magnifying glasses, hand-dredges, jars, buckets and knives - not to mention preserving alcohol - are of little usefulness in gathering shells and can be quite cumbersome when swimming unexpectedly.
The expert, on the other hand, limits his gear to crow-bar and sugar-sack and takes his alcohol strictly for self-preservation.
Note: The advanced beginner, having attained sufficient proficiency to warrant the purchase of a crow-bar, should at first limit himself to the destruction of only smallish patches of living reef as the utter devastation of larger areas is likely to give him very painful blisters indeed and is best left to the calloused experts.

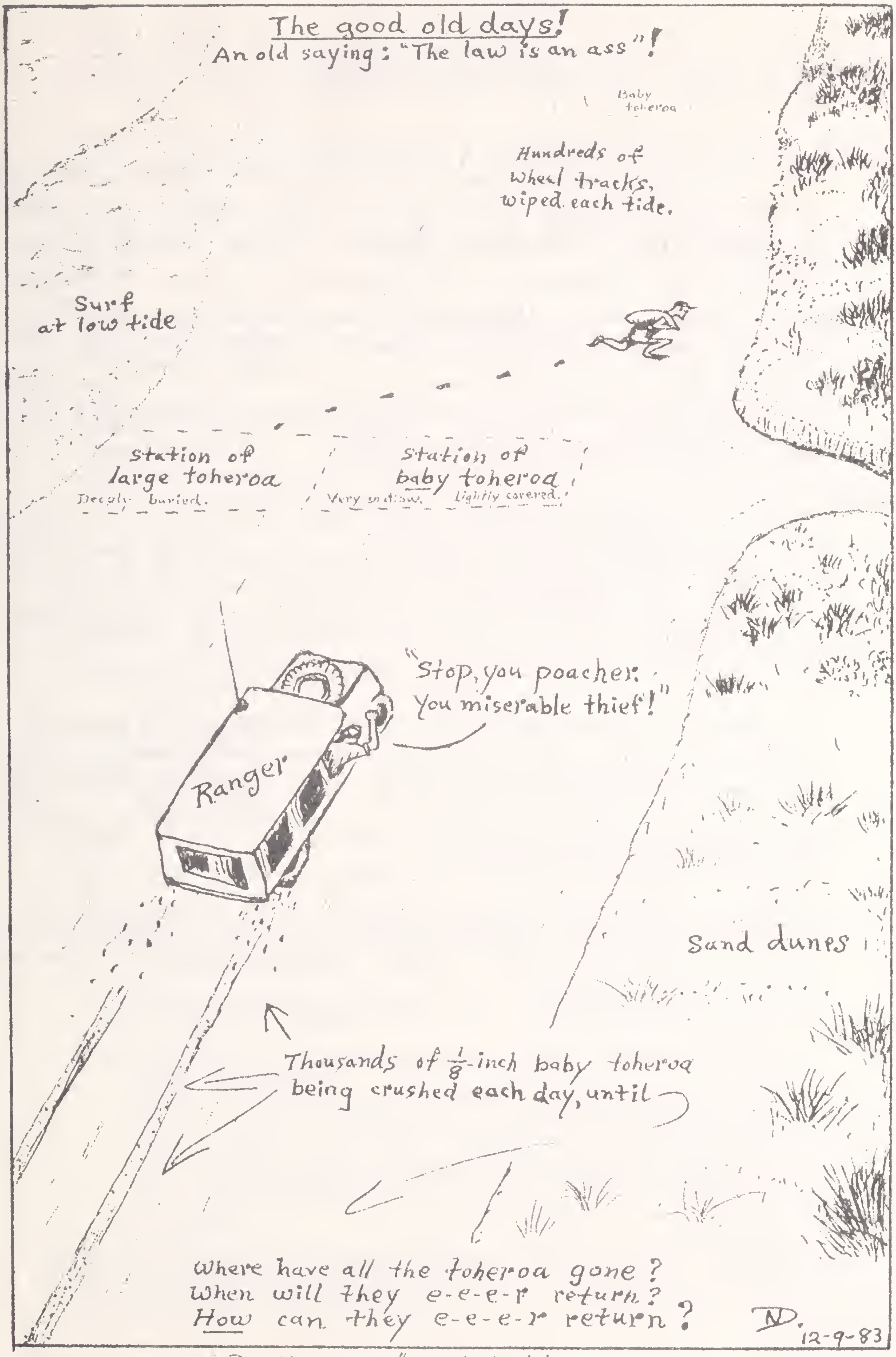
9. No two experts agree on the optimum method for cleaning shells. The following experiment was recently conducted by the writer and could serve as a data-base for further studies.
Object: To clean a shell effortlessly and economically.
Apparatus: Sand-box, household bleach.
Specimen: Monoplex australasiae
Theory: The "Reroval" principle applies.
Method: The specimen was treated with bleach then placed in sand-box in corner of back-yard.
Observations: The following sequence took place:-
(a) The periostracum was removed by the bleach.
(b) The operculum was removed by ants.
(c) The decomposing mollusc was removed by maggots.
(d) The shell was removed by a dog.
(e) A cat took proprietory interest in the sand box and was removed (several times) by a good boot.
(f) Family and neighbours removed themselves to the far end of their premises if only to escape the plague of flies.
(g) The pervading residual odour has not and cannot be removed.
Conclusion: Technology has not advanced in this field. Further work should be removed to a very remote one.

10. The naming of shells is particularly easy - witness the multiplicity of names for so many individual species and the frequency of changes.
Latin and Greek roots are chosen to assist the layman.
One cannot but admire the virtuosity of authors who named shells after the locality where found, e.g. Pecten novaezelandiae and Maoricolpus manukauensis. This obviates the necessity for bibliographic research providing one has access to an atlas or road-map.
The writer has further simplified this approach and his collection now includes several fine Cabestana bucklandsbeachi, Chione bucklandsbeachi, Penion bucklandsbeachi and so on.
A recent find of Alcithoe upperqueenstreetensis has been discredited.

11. To the beginner, experts and shellbooks alike are no help whatsoever in determining distribution and prevalence of a species.
The truth is simply that whether a shell is rare, uncommon or common depends entirely on circumstances and emotion. In fact the very same species, in the one locality, is frequently classed as all three.
For instance, an uncommon shell picked up by a lucky beginner right under the nose of a piqued expert is instantly identified as "terribly common" but is later described by the finder (to even newer collectors) as being "extremely rare".
A fourth category - abundant - was found necessary to classify the prevalence of all species at Takapuna "a few years ago".

12. The description of shells in the learned texts is perfectly self-explanatory and requires no comment but for a word of gratitude to the patient authors who obviously cherish simplicity.
Why bother to describe a shell as "shaped a bit like a hairy, longish pear with notched ribs in front of the seams on the pointed spire" when "ciliate, sub-pyriformly-elongate, crenulated presutural costae, apexially acuminate" will do just as well.
Such terminology very much assists the beginner who quickly finds the ambiguity most favourable, i.e. The one description suits many of his shells or, conversely, that the one specimen is described several times in differnt genera.
This facilitates positive identification.
There are also obvious advantages to shell-book publishers who need not painstakingly match descriptions against photographs but rather can insert material at random or to suit space and can thus effect cost savings.
Alternatively, the pages can be re-arranged, again at random, and the new-look book produced as Volume II.
And besides, which beginner does not thrill to the necessity of brushing up his Latin, learning new words (or re-learning archaic ones) and relish the need to leaf through his dictionary in search of such gems as "Clathrate", "Ochraceous", "Rhachidian" and "Scabrous".

"Scabrous"? - a., rough surfaced; hard to handle with decency. (Concise Oxford.)
Perhaps the most fitting epithet for many shells and shell collectors and certainly for Conchology in Toto.



"Paddle crabs", tut, tut!
(The crab live with the sublittoral tuatua while the toheroa once lived profusely in the beach.)

SHELL QUEEN OF SHANNON

That is the name we ought to have called the late Mrs May Third. Not a lot of knowledge of her seems to be available to local members of the Society. In speaking to a local resident of Shannon, I managed to verify the fact that Mrs Third had indeed been collecting shells for years. The Manawatu Museum supplied the fact that she had started collecting in the 1920's and had still been collecting up to the time of her death on 27th April 1982. Her correspondence with collectors from all over the world, her personality, how she became interested, where her hobby took her and the people she met, will all be the subject of another article.

The way that it was economically in the 1920's, the postage and packing for Mrs Third's correspondence and swapping activities would not have cost her very much, but in the 1980's, due to inflation, I am sure that it was almost impossible for her to exchange information or shells to any great extent.

Well, what was to become of her collection? Fortunately all was not lost when Mrs Third died. The Curator of the Manawatu Museum asked Mrs Third's daughter whether her mother's collection could be put on display. Happily for the public it was all arranged, and so everyone now has the benefit of the prize part of this collection.

The displays of shells illustrate how scientists classify molluscs and show how shells fit into the Animal Kingdom. Specimens from all the major shell families are represented.

Ann Perrott

ITEMS OF INTEREST

- Norman Douglas found two Globisinum drewi near Waiuku in perfect or near perfect condition. This species was thought to be a deep water shell yet in this area the coast is very shallow for fifteen miles out to sea.

- Steve O'Shea found Hydatina physis sitting on huge egg clusters. This is clear evidence that this shell is an established species in New Zealand waters and not just the result of occasional spat falls.

- Mrs McLoughlin found a sinistrally coiled Buccinulum species at Takapuna. Do any other collectors have sinistrally coiled specimens of New Zealand shells?

- Andrew Penniket collected Septa parthenopeus from the Open Bay Islands (off the N.W. coast of the South Island). This species is not normally found south of Kapiti.

- Norman Douglas obtained Alcithoe jaculoides and Alcithoe arabica from seventy fathoms off the coast of New Plymouth. This contradicts the supposition that A. jaculoides is just a deep water form of A. arabica since the two species were living together. It is also a considerable range extension for A. jaculoides since this species was listed by Powell as being found on the east coast, north of East Cape.

- At the March club meeting featuring the family Cymatiidae, Bob Penniket was able to tell us of the following name changes:

  Cabestana tabulata (Menke, 1843) is the new name for Cabestana waterhousei

  Septa exaratum exaratum (Reeve, 1844) is the new name for Turritriton tabulatus exaratus

  Septa parthenopeum (Von Salis, 1793) is the new name for Monoplex parthenopeum

  Sassia parkinsonia (Perry, 1811) is the new name for Austrotriton parkinsonia

  Sassia palmeri (Powell, 1976) is the new name for Proxicharonia palmeri

  Sassia kampyla (Watson, 1885) is the new name for Cymatona kampyla

  Sassia kampyla tomlini (Powell, 1955) is the new name for Cymatona tomlini

  Fusitriton magellanicus laudandus (Finlay, 1926) is the new name for Fusitriton retiolus

  Argobuccinum pustulosum tumidum (Dunker, 1862) is the new name for Argobuccinum tumidum

  Ranella australasia australasia (Perry, 1811) is the new name for Mayena australasia
  (Other names applied to this shell: blacki (Powell, 1954) and vossi (Powell, 1952) are officially abandoned, but having been described in literature, can be used. The name "blacki" can be applied to shells from the Stewart Island / Foveaux Strait region, at least until they are demonstrated to be not isolated geographically, and "of vossi form" to shells that correspond to the vossi description of Powell.)

  This leaves Cabestana spengleri (Perry, 1811) Turritriton labiosum (Wood, 1828) and Ranella olearium (Linnaeus, 1758) as the only cymatids in this group with their names unchanged.

POIRIERIA

Auckland Museum
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EDITORIAL

There seems to be little public awareness over the gradual destruction of our endemic land snails. Already suffering heavily under the predation of introduced animals such as pigs and rats, their chances of survival are being further diminished by the destruction of their habitats in the interest of more farm land or more pine forests. While the heart warming story of the saving of the Chatham Island black robin has been widely aclaimed in the press and other media, the quiet destruction of our native land snails has gone virtually unnoticed. Our *Paryphanta* and *Placostylus* in particular are magnificent species that must be saved at all costs, and we as shell collectors must be leading the fight to save them. In this issue, Peter Jamieson writes of the complete destruction of the habitat of *Powelliphanta lignaria rotella* and the presumed loss of this sub-species. Yet how many of us are doing something to save them by writing letters to members of parliament or by other means? It is our duty as shell collectors to be doing this, and I strongly urge you to act before it is too late, and the only specimens left of these shells are the faded, dusty ones in our shell cabinets.

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Editor

OBITUARY - POWELLIPHANTA LIGNARIA ROTELLA

by P.R. Jamieson

Over the Easter-Anzac period, 1984, five members of the Wellington Shell Club (Jenny Raven, Meg Taylor, Bruce Hazelwood, Eric Scott and Peter Jamieson), raced down to Northern Westland in search of Powelliphanta. We were of course armed with a permit from the Wildlife Service to collect empty shells, and also detailed instructions on specific information wanted by Mike Meads, D.S.I.R. So besides adding some specimens to our own collections, we hoped to help in the ongoing research on Powelliphanta distribution, and ecology.

To start with, the trip almost didn't happen. The night before our departure I received a panic ring from Eric to say the booking for Eric's van was the wrong date! Guess whose fault! Too late to change on the night before Easter Friday. To cut a long story short, only a mischievous diversion by Eric, and a quick plant of the accelerator saw us safely on the ferry, wrong booking or not.

Eric's expert use of the accelerator soon whisked us off down through the Wairau River Valley and into the Buller Gorge, where we were to make our first stop. An undescribed form of Powelliphanta can be found right on the roadside. It was approaching dark by the time we arrived, but a quick scramble amongst the bracken, blackberry and second growth brought to light 25 snails in various states of preservation. Two live ones were weighed, measured and returned. The idea was to collect all empty shells, no matter what condition, so some determination of predation rates could be calculated. As darkness crept in, our came the whistling tree frogs in great abundance - a fantastic chorus.

It was probably just as well it was dark by the time we reached the Karamea Bluffs - a notorious piece of road. After a few hairy corners, we arrived safely (JUST!) at the Karamea motor camp, our base for the next five days.

The first day we planned to tackle the lower end of the Heaphy Track, in search of Powelliphanta lignaria annectens. However, it wasn't till we arrived at Karamea that we realised this was also the venue for the annual meeting of the Native Forest Action Council. And our camp, was also theirs! This then posed a problem, trying to keep out of the public eye as we had been asked, especially as to where we wanted to go, so did the N.F.A.C. hoards. So we found the beginning of the Heaphy Track more like Auckland's Queen Street on a Friday night. But once over that first intreped swing bridge, it was off like a rocket, past the masses, over Kohaihai Bluff and on towards the snails.

Arriving at the area, we dumped our day packs out of sight, and headed off into the Nikau palms and other vegetation. Snails were easy to find, and 26 live ones seen both on the surface and under litter. Quite a job to weigh and measure, before returning to their habitat. After 1 3/4 hours collecting, a total of 209 empty shells were found, and we were pleased that among these were some fine large specimens in good condition. Although this collect took most of the day, we were obviously jubilant at such a successful collect.

On the way back, and among the flax grove near the Kohaihai swing bridge, we stopped briefly for a search for Flammulina jacquenetta. We all managed to find an example or two, but none were alive this time, to display their brilliant bright red animal.

A quick tea at the local and then it was off to the Oparara Quarry in the dark. This time after a minute snail, Potamopyrgus cresswelli. Eric, Bruce and myself scrambled off over broken rubble from a recent quarry blast and on to the beginning of the Fenian Track. Armed with torches, we searched the undersides of leaves and twigs in the seepages along the track. Once located, we collected a small bag of litter and twigs for latter sorting. Returning to the ladies, we found they had not been idle. Jenny, the rock hound amongst us had discovered the quarry was a mass of rock containing excellent deposits of pink feldspar. Needless to say we all helped ourselves to some samples.

An early start the next day (at least as early as Jenny's sleeping habits would allow), saw us off south this time, over that Karamea Bluff - a piece of road we eventually became familiar with. Today's major effort was to collect Powelliphanta lignaria johnstoni, tackling this from Ngakawau. A very good walking track, (actually on old tramway), leads up the Ngakawau River. And what an impressive walk it is, with amazing views of the Gorge itself, and a large waterfall at the end. After spending some time admiring the scenery we headed off again for johnstoni. Once reaching a suitable area, and being careful not to collect at a special wildlife survey block, we soon started finding snails. And they were in good numbers too, though only 2 live snails were seen. One of these was in the middle of lunch - a native veined slug, probably of the genus Pseudaneitea. Total collect - 210 empties in under an hour, with a reasonable number of whole shells, some of which were beautifully marked with bands of dark red.

Heading back to Seddonville, we stopped near Chasm Creek to sample a hybrid colony - Unicolorata x rotella. Being nearer to civilization, snails were scarce, with the great majority rat chewed, though a few live ones were seen.

Another two tiny colonies further up the valley were also briefly sampled. There are unicolorata, though there is always a ruforadiata influennce with colonies near the Mokihinui river. Again snails were very scarce, the areas of second growth they inhabit being largely trampled by cattle. This seems to be the usual state with all colonies close to settlements.

Well Monday was here already, and while the weather remained excellent we decided to head up a tributary of the Karamea River in search of Powelliphanta lignaria oconnori. As conditions were expected to be rough, Meg very wisely decided to stay put in the camp. It was certainly rough going, walking up a rocky creek, clambering over masses of fallen logs and skirting round massive rock falls. We were glad to reach the colony, but whole snails were very hard to find. Many otherwise fine specimens had a hole chewed in the underside by rats. The snails here show a definite preference for the flats either side of the creek, as a search of the steeper slopes revealed no snails. All told, it was hard work, and two hours yielded only a handful of complete shells and two live ones. The arduous trip back only helped enhance the value of the specimens obtained.

With still a little time left, we raced back to the camp for Meg, with the intensions of visiting the Arches - one of the most spectacular sights I've ever beheld. Knowing that the private forestry road had a locked gate at its lower end, and permission of entry always denied, we were advised to take a detour - the "Tourist Route". Little did we know what an atrocious West Coast track this would be. Eric's van had to negotiate nothing short of boulders, deep ruts, and washouts, as well as hills of very steep gradients that were just clay. I'll have to admit here that if it wasn't for our experienced driver we would never have made it. Once we reached the forestry track again, it felt like a paradise in comparison. But it was still a long windy drive to the Archers, but well worth it. Annectens is also found in this area, but logging and planting of exotics is certainly not condusive to snail survival. Consequently a quick search revealed only a few old broken pieces. It was here that we were to have the first taste of the Forest Services' slash, burn and replant in exotics scheme, which is sweeping the country, and especially vast areas of prime West Coast native forests. More to come on this.

Anyway it was the big Arch we were all keen to see. A massive awe inspiring limestone structure stretching across the Oparara River, and only 20 minutes from the road side. We were all very impressed, and it's a pity such an important natural wonder isn't more accessable to the general public. Is it that the Forest Service wants to keep this under "lock and key" in case too much public interest demands stopping of logging in the region? The biggest thing the Forest Service has on its side is public ignorance. DO vist this place if you ever get the chance. I guarantee you will not be disappointed!

By Tuesday we still had a lot to do, with lignana and lusca still to collect. Back over the Karamea Bluffs again, stopping at two localities for lusca. The first revealed good numbers of snails, but many rat chewed. Then on to the Mokihinui River to collect lignania. At the favoured spot they were still plentiful, with a very low rate of predation, though many of the whole shells were old and decaying. With the easy ones out of the way we still had plenty of time to make some attempt at that mystical sub-species, rotella. I say mystical because this has always been a difficult one to collect, even though close to Seddonville. There has never been any easy access to the area, that is until the Forest Service took an interest here. Now there is a criss cross of vehicle tracks everywhere, and having a recent map of these, we decided to give it a go. Skirting around the Hydro State Coal Mine Ridge, we soon came upon the scene. Whole hillsides, valleys, the lot. All burnt to the ground. Now we knew this was going on, but to actually witness the shear magnitude of destruction is an impression none of us will ever forget. This is how the story goes. Forest Service selectively log the area (that is, take out a few suitable trees, and wreck the whole place in the process), then clear fell it. Follow with a burn fueled by napalin, and all you have left is a black mass of nothing. What was important prime lowland forest, disintegrated, snails and all. Can you imagine how angry we all felt, that as collectors without a permit we couldn't even collect empty shells. But the all powerful Forest Service, knowing the snails are there, and ignoring Wildlife recommendations to protect some snail habitat, can light a match and sentence this truly beautiful and unique subspecies to extinction. Now some would argue that "it's just a form", and there are plenty of other snail colonies left. But I would like to argue that form or whatever, Powelliphanta lignaria rotella is part of

every New Zealander's heritage. It is as unique to New Zealand as the Kiwi or the Chatham Island Black Robin, and equally deserving of total rigorous protection. And yet the Forest Service has plans to log, clearfell and burn the entire distribution of rotella. Then plant the area in exotics, rendering it totally unsuitable for snail habitat.

Now on with the story. We headed through the burnt wilderness, no, emptyness, towards the Saint Andrew's Stream, where some bush, though logged, still remained. A frustrating hour revealed only 6 broken empty shells and one small whole one. So we decided to try another area, and headed through more blacked land to behind the Hydro State Coal Mine Ridge where I had collected in the past. At the end of a very rough forestry track we discovered a small area of untouched forest. Again we searched like made, trying to dodge the very cutty, cutty grass. Again only a few broken shells, and no live ones seen. So we headed back towards the van, very disgruntled and very disappointed. It was Jenny who decided to detour into the burnt area, and there was the evidence. Charred pieces of snails all over the place. Burnt, exploded, distorted remnants of their former beauty. So we started looking in earnest. Occasionally we found the odd whole shell that had somehow escaped the full force of the burn. It soon became apparent that a number of snails had survived the holocaust, only to succumb to the drying effects of the sun, having no cover to hide under. Out of the fire and into the frying pan, to change an old saying. We must have collected hundreds of charred shells, and left many more there, mostly just fragments. And then it was Jenny again who found it. A live one. Right out in the middle of the burnt area. Never have we all felt so concerned and disturbed by such a find, and we carefully placed the survivor back into the remaining bush. Though we all knew its fate would be tested yet again in the near future.

I should say at this stage, that Eric more recently flew over this area. He reports that the total area is now logged and burnt. Is this the end of rotella? Will I, and others, in years to come, when showing someone my collection have to say "Oh yes, I collected these some years ago now, but they are now extinct - burnt out of existance". It certainly looks like this is going to be the case. So cherish those rotella. There may not be anymore in the pipeline.

Our last day, Wednesday, back over the Karamea Bluffs for the last time. This time stopping on the north bank of the Mokihinui River to try and locate a hybrid colony of lignaria x unicolorata. Success at last after several futile attempts in the past. This colony is certainly interesting, with snails found identical to both lignania and unicolorata, and every variation in between.

And then the rain came, as only it can on the West Coast. But that was not going to stop us snail enthusiasts attempting to collect Powelliphanta rossiana patrickensis at Deniston, near Westport. It's quite a climb up the range to the ghost town, and then on from there over old coal mine roads. Knowing exactly where we were was impossible in the mist and downpour. So we abandoned maps and tried to "think like a snail". First stop, all we all got was VERY wet. On again but this time only Eric and I braved the elements. At last, a fragment! Then another, about 10 all told. No whole shells, but then not the conditions to look for them either, and only an old marijuana plot to add any interest to the outing.

Now wet and cold, we passed up the idea of another go at the Buller Gorge Powelliphanta, and headed to a local pub to take the chill out of our bodies. Then on to Picton, and home, late, tired, but very glad to have had the experience of seeing and collecting some of our giant snails while a few of them still remain.

SOME OBSERVATIONS ON WAINUIA FALLAI AND WAINUIA EDWARDI

by Bev Elliott

On November 26th, 1984, I had tramped over the Kowhai Saddle in the Seaward Kaikoura Range. As I was descending into the Hapuku headwaters I noticed scaps of Wainuia along the track. This was on the ridge between two huge shingle slips, at about 3000 ft. Map reference 920-067, Kaikoura Map, S49. It had been a long day and a tough tramp, and my first reaction was, "I'm too tired, I can't be bothered". But the pieces were so common and so large, that off came the heavy pack, and despite the difficulty of finding a Prickly Shield Fern large enough to look under, I soon had two fine Wainuias, 35 mm and 38 mm. I wish I had tried harder, but there didn't seem to be anywhere suitable to look. Further down there was a large amount of Prickly Shield Fern, which is Wainuia fallai's favourite covering. But here, though the place looked ideal, I found only one small shell.

It is my opinion that Wainuia fallai and W. edwardi are the same. The theory seems to be that edwardi is the larger, and more southern species (North Canterbury), while fallai is the smaller northern species (Kaikoura). In reality, this doesn't work out. This 38 mm shell from the Upper Hapuku is the largest one I have found, and one of the pieces (enclosed) appears to have been every larger. The most northerly colony that I know of, at Flaxbourne River, Ward, 70 km north of Kaikoura, also produces fine large specimens, up to 34 mm. The largest W. edwardi I have found, however, is only 25 mm from Ashley Gorge.

Possibly somebody is doing research on Wainuias, and may be interested in these comments, bodies, and bits.

PERIOSTRACUM PRESERVATION

by Norman Douglas

Abstract

After twenty years of experiment and observation in this field, a satisfactory system for the preservation of the epidermis, or periostracum, on shells is available. It can be accomplished with both little work and at little cost.

Beginning collectors are naturally enthralled by the great beauty of the living Cymatids. Therefore, it is not at all surprising that there is a great urge to preserve, in a natural-looking state, some of the top specimens for a collection. However, it is sad to relate that the first attempts to save these rare treasures is usually one of great disappointment. When dried out without any treatment the periostracum

cracks, peels off the shells, to leave the specimens a forlorn travesty of their former grandeur. Little wonder, then, that periostracum is usually removed and the bare shell rubbed with a little baby-oil, or similar.

Experiment

About twenty years ago, the writer made a determined effort to find some way to prevent this peeling off the periostracum. It resulted in an emulsion system that worked reasonably well but involved a lot of work. This system was explained in "Poirieria", Vol 3, Part 6, March 1967, page 84. It preserved the epidermis of some species very well but the long hair-like processes of the Monoplex still dried out too hard.

It was realised then that there must be a better way. As the result of further experimentation a better system was discovered which involved the use of glycerine, rather than oils. This system is offered now and explained below.

Results

A perusal of my numbered and catalogued collection of Cymatids has just been made and it is perhaps noteworthy that the Monoplex treated with the earlier emulsion system in 1965-66 are still in good condition, except that the long hair-like processes are still. By comparison, specimens treated in 1972, using the glycerine process to follow, are just as well preserved but with a much softer result. Even the long hairs of the Monoplex are still soft. There is no hesitation on my part in recommending the use of this more recent glycerine method. It is simple, costs almost nothing and is very easy to do.

Formulation

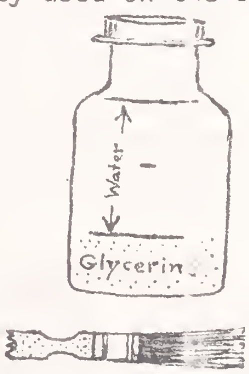
One part glycerine
Two parts water

Poison this with neutralized formalin to preserve and prevent the growth of mildew on the periostracum.

The glycerine is a non-drying, oil-like, water-soluble softener and the added water gives greater control of quantity used on the specimen.

An old ENO bottle makes a useful container - a 3/4inch paint brush an applicator.

To neutralize formalin, keep a block of limestone in the formalin bottle. (A chemist's recommendation. He said it brings the Ph up to neutral where it stops.)

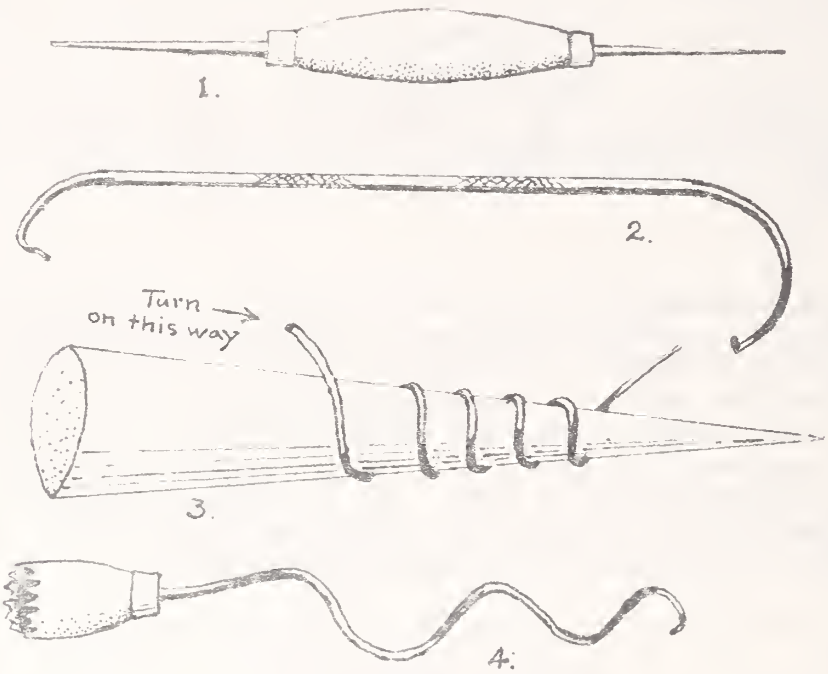


The Hydrated lime used by gardeners is just as good as limestone. If there remains a sediment from this in the formalin bottle then it will be neutral. One remembers, too, that a shell is a lime composition and therefore lime seems a logical neutralizer.

If using an ENO half-cup bottle, then add one dessertspoon full of the neutralized formalin.

How to use the formula

First remove the animal. To do this let the animal die in the air in the same say as it would die storm-cast on the beach. It will die this way without apparent pain. It takes a few days to die and a few more days, or a week or so, to decompose enough to be removed with the wire hook and "cork-screw" as illustrated here. See number 2 and 4. No 4 is made by winding a stainless steel wire around a wooden mandril. See figure 3.



If all the animal does not exit by this method, (common with Cymatids) then let it decompose further, hosing the shell out every few days until all animal matter is removed. This is important. One has to be patient. Keep the shell in a box in the hedge-row, or somewhere, definitely out of the sun and away from mice. Remember that the periostracum must not be allowed to completely dry out at this stage. If in doubt, simply apply a coat of the glycerine formulation. However, also remember that formalin, if it enters the shell, will hinder the further decomposition necessary for removal of that last little bit of animal matter in the tip of the spine of the shell. Judgement is necessary, both by nose and eye!

If any animal matter remains in the shell the collection will smell and be invaded by insects. Often, if we hold a shell up to a strong light, a shadow will show in the spire-tip if animal matter remains there. It is common sight in collections!

Drying the Shell

When all animal matter has been removed from the inside of the spire, then it is time to dry the shell - but never in the sun. As the periostracum starts to dry, coat it with the glycerine solution as required. It may take two, or even three applications in order to obtain the desired results. However, do not use glycerine pure. It

will be found too strong. The above glycerine and water mixture will provide you with full control and the long hairs and frills of your "Monoplex" will not curl or become hard and brittle.

Operculum (aperture trap-door)

When removing the animal in the first place be sure to save the operculum. It is the only one that really belongs! The shell now being dry inside, a pad of cotton wool can be pressed into the aperture on to which the operculum can be stuck by the use of a little water-base glue. The wooliness of the cotton wool can be laid smooth around the operculum area at the same time by the use of the tracer tool No.1. Use this tool to handle the glue, not a brush. Also, by dipping the tip of the tool in an appropriate dye at this stage the cotton wool can be made the same colour as the living animal that was removed.

Guide notes should be made when the animal is living. Beginners often insert operculums upside down, so either a good memory or notes are needed!

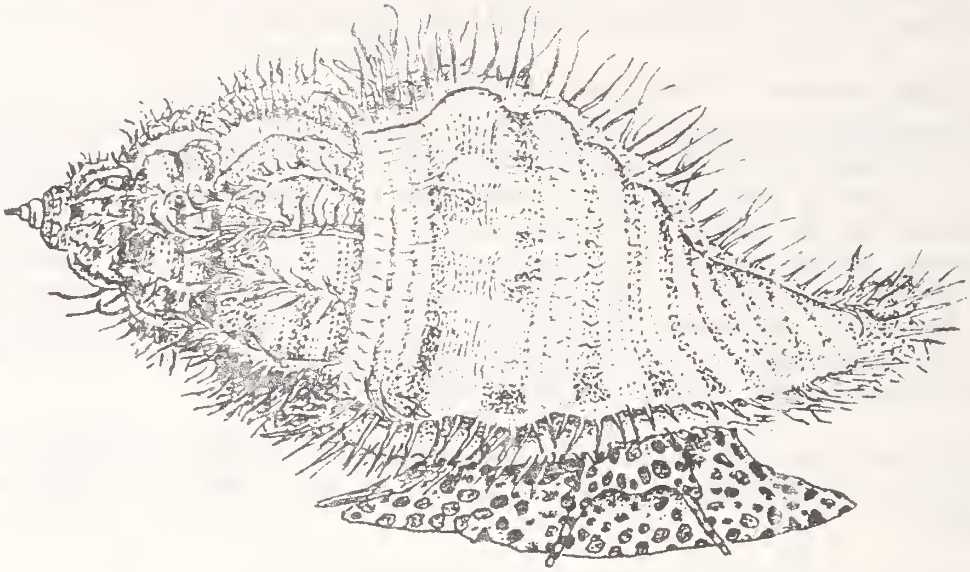
Storage of specimens (Concerning bleaching)

Mayhap it is unnecessary to mention that specimens kept on display should never be kept in the direct rays of the sun. Nevertheless, we must always keep in mind the fact that there is probably no greater bleaching agent in the universe than the sun and that all things are divided by time. For long-time storage, a dark cool place in trays is probably the best, rather than lighted display cases. And here we may discover that things are not only divided by time, but also by money!

Drawings

The appended pen and ink sketches were made some years ago by observing these animals in life. They depict some of the species to which this article applies. There are many others.

May you have many happy hunting and drawing sessions.



N.D.

Septa parthenopeum (Von Salis, 1793)

= Monoplex parthenopeum
= Monoplex australasiae (Perry, 1811)

The drawing is an impression of a specimen taken on the 8th March, 1966. It was hiding on a ledge under a tidal rock.

The "Monoplex" animal is of remarkable appearance, being pale green spotted with bluish black, brownish black and pale brown - a very beautiful pattern. The foot is mottled brown beneath. The shell, covered with golden, dark brown epidermis, is also remarkable for the profusion of hair-like processes arranged in axial rows upon it. Shell: 115 mm x 65 mm.

Cabestana tabulata (Menke, 1843)

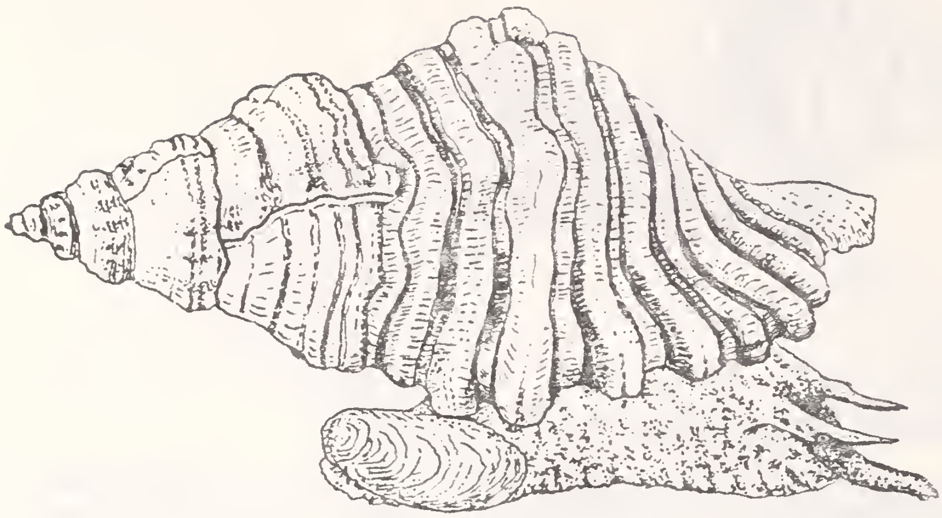
= Cabestana waterhousei segregata (Powell, 1933)

The specimen was found on the 5th April, 1966. It was on a rock briefly exposed by the spring low tide. The rock was almost in the channel where the tide flows quickly past. "Waterhousei", amongst sea-squirts, was in a hole on the side of the rock about six inches about water level.

The animal is spotted with purplish brown on a pink base. It is patterned like "Monoplex",but in a different colour. The eyes are near the base of the feelers which can be withdrawn telescope-fashion, like the proboscis.

The shell, 43 mm by 25 mm, is completely covered in brown epidermis except for a smooth, white protoconch of three whorls. Following the protoconch, the first two whorls have hairy processes at each nodulation, like Monoplex. The third whorl finds the hairy processes becoming less frequent, while on the fourth the hair is to be found on the varix of the outer lip only.

The sole of the foot of the animal is pale orange.



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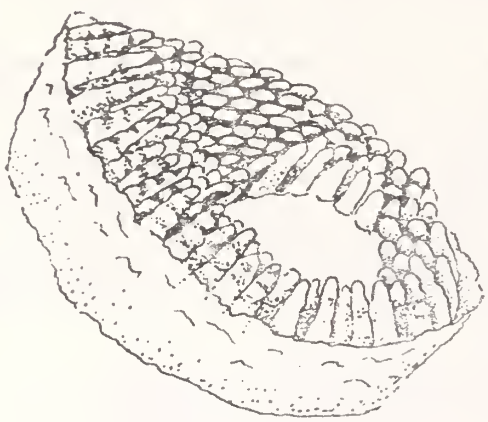

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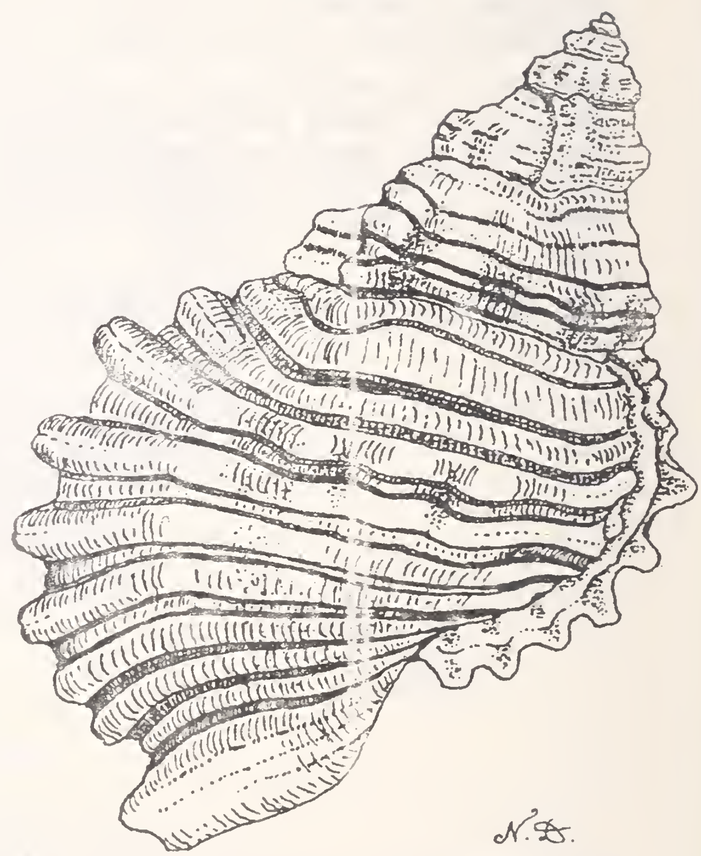


Cabestana spengleri (Perry, 1811)

Found living on a rock at spring low tide, 24.10.1965.

Shell: 120 mm x 77 mm. Golden brown, lined with dark brown. Purplish brown around edges of outer lip. Inside white. Operculum horny, brown. Animal a purple-brown mottle on a golden background. Eyes small, well out on outside of tentacles. Animal drawn with proboscis extended. It can be withdrawn out of sight between the tentacles. It is trunklike, A. B: Egg capsules.

SOME OBSERVATIONS ON AMALDA DEPRESSA

by Ian Scott

As a collector with experience in hunting for shells in and around tropical coral reefs, my initial interest on returning to New Zealand was in shells from the major tropical families such as the Olividae. Finding these shells proved to be similar to finding their tropical cousins; namely by either snorkeling or wading across sand flats at extreme low tide, locating their trail, and hopefully digging up an olive shell at the end of it. Some animals actually pop out of the sand shortly after the tide turns, but most remain hidden with only their siphon showing. However, in either case their bullcozer like trails give them away.

While Amalda australis proved to be abundant in sheltered bays and harbours such as Parengarenga Harbour and Whangaparaoa Peninsular, Amalda depressa proved to be illusive. In fact I started to doubt whether it existed at all and thought New Zealand collectors had been duped into believing small, squat A. australis were a separate species. Such a belief was encouraged after examining large numbers of A.australis and finding it to be very variable in size, colour, shape, and in how much of the spire was callused. Looking at specimens labelled "A. depressa" in other collections did not help as many fitted into the range of variation I had observed in A. australis; and because many collectors seemed hesitant about distinguishing between the two species, or else did so in a somewhat arbitrary and unscientific manner.

All this leads to a collecting trip I made with other club members to Wattle Bay in the Manukau Harbour last Easter, where I discovered the "real" A. depressa. Even then I did not realise that I had found them until sorting through specimens afterwards!

The most striking difference that separates the two species at this locality is their colour difference. While A. australis are dark brown, looking almost black when first collected; A. depressa are quite a pale honey brown in colour and quite different. However, both species fade considerably when dead and end up looking almost the same colour - a fact which probably explains my inability to distinguish them when looking at specimens in collections!

In "New Zealand Mollusca", Powell distinguishes A. depressa from A. australis by their shorter spire, wider body shorl and their outer-lip projecting beyond the spire outline. While I have found these to be a useful and general guide, they are by no means definitive. For instance, in any population of A. australis, it is possible to find specimens that have short spires, wide body whorls and an outer lip projecting beyond the spire outline. However, there is one difference; such specimens of A. australis are in my experience all in the 18 to 30 mm size range; whereas genuine A. depressa are typically smaller, with my largest specimen being only 17 mm, and 18 mm being the maximum size recorded by Powell. None of the specimens of A. australis below 18 mm that I examined showed these properties of A. depressa. Thus according to my survey it would be possible to differentiate between A. australis and A. depressa using the properties of spire height, body-whorl width and projection of outer lip beyond the spire outline

provided size was taken into consideration.

The other major difference that Powell notes is that "the coloration differs from that of australis only in that the upper white band is constantly much wider." I have not been able to verify this statement; in fact I have found no correlation at all in my specimens between width of white bands and species. Neither can I perceive such a difference on the shells illustrated by Powell, and I'm not even sure what he means by "the upper white band". If he means the band on the top of the body whorl then I can find no significant differences in my specimens; and if he is referring to white bands on the spire then my conclusion is the same.

I found my specimens of A. depressa amongst large colonies of A.australis, sharing the same silty habitat. I found one A. depressa for about thirty A. australis, but this ratio only refers to the one small area of Wattle Bay I sampled, and could be different elsewhere. Norman Douglas, in a personal communication, said that he had observed that whereas A.australis were widespread, A. depressa occured in small colonies.

Checking around other collectors, I found that almost everyone has their specimens of A. depressa from the Manukau Harbour. According to Powell this species is distributed throughout the North Island and the northern part of the South Island. I would appreciate reports and or specimens from other collectors confirming this. At this stage the only specimen outside the Manukau Harbour I have seen is a beach specimen from Spirits Bay in the far north.

In conclusion, I believe that A. depressa can be quite easily distinguished from A. australis, at least in the Manukau Harbour area I studied.

OFFADESMA ANGASI (CROSSE AND FISCHER, 1864)

by Joan Coles

Offadesma angasi is one of our larger bivalves but is less frequently found by collectors than many of our other bivalves. This is due largely to the depth at which it commonly lives and to the very fragile structure of the shell. Occasionally it is found intact on beaches after a storm but more often it is broken by wave action, or if washed up alive, by gulls feeding on the animal. Such a wash-up of mature and juvenile shells occurred on Orewa Beach, north of Auckland, several years ago.

Recently dead specimens may be found occasionally on sandy-muddy protected beaches at low spring tide level. Club members have found undamaged ones at Beachlands, Hauraki Gulf and at Okoromai Bay and Shakespear Regional Park, Whangaparaoa Peninsula.

When searching at low tide the presence of Offadesma may be indicated by two very well defined siphon holes approximately 6mm in diameter, 2-2.5 cms apart. These are similar, though larger, than the siphon holes of Struthiolaria papulosa which may be more familiar to collectors. Great care is necessary in digging for this bivalve. It lives transversely in the substrate, if mature, at a depth of approximately 20-22 cms

(8 to 9 inches). Gentle separation of the sand is necessary to prevent damaging the fragile shell.

Mature specimens may attain a height of 65.6 mm, length 94.0 mm, thickness 39.0 mm. The right valve is considerably inflated, the left rather flat, with slight gaping to allow the emergence of long siphons. The hinge differs from that of most bivalves, being without teeth but strengthened by a chitinous ligament (resilium) set into a depression along the inner hinge margins (chondrophores) which hang down from the beaks. The beaks are transversely cut and filled within by a chitinous material. Fresh specimens have a silvery lustre. The soft, greyish-white animal can be removed when dead by gentle pressure with a thin knife to sever the muscles. Minimal opening of the valve is required.

Reference: New Zealand Mollusca
A.W.B. Powell

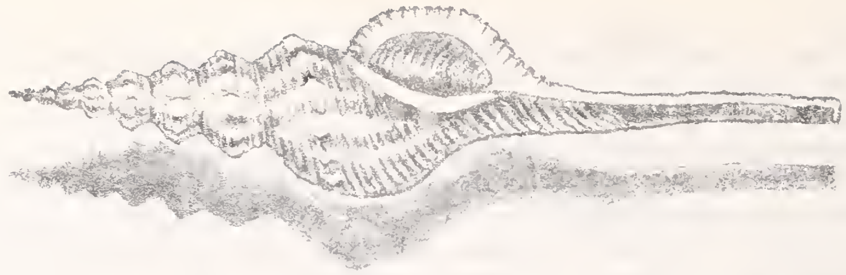
A SHELL COLLECTING TRIP TO TONGA

by Peggy Town, Ann Randall and Margaret Morley

In August, 1984, six club members enjoyed a shell collecting holiday in Tonga. Our group comprised Peggy and Stan Town, Irene Kindlesides, Ann Randall, Nancy Smith and Margaret Morley. We arrived in Nuku'alofa on a balmy tropical night which was a welcome change from Auckland's winter winds! After spending the following day being introduced to the delights of coral reefs and actually picking up live cones and cowries on the reef across the road from the guest house, we prepared to set off for Ha'apai the next day.

Ha'apai is about a forty minute flight from Tongatapu. It was a wonderful sight flying over many tiny islands and atolls, I'm sure many of which would be a sheller's paradise if only it were possible to get to them at low tide! We only had three days in Ha'apai, but made the most of it by being able to shell early morning, often before breakfast, and again early in the evening. The northern tip of Lifuka Island, across the causeway built with New Zealand aid, was a good place. Our finds included live Fusinus colus (see illustration) found at low tide in muddy areas on the edge of eel grass; and the spectacular nudibranch, commonly called the "Spanish dancer". Local children, trying to be helpful and waiting to practise their English would often dump handfuls of "junk" into our bags of shell "goodies"!

Ha'apai was badly hit by a hurricane in 1982, as evidenced by the many topless coconut trees and the relief houses again built with New Zealand aid. Our main memories of Ha'apai are the way the days began; church drums at 5.30 a.m., followed by church bells at 5.45 a.m., followed by rather loud singing at 6 a.m.; plus dogs barking, and when they stopped, roosters taking over at all hours of the night!



Fusinus colus (Linne 1758)
1¼ times actual size

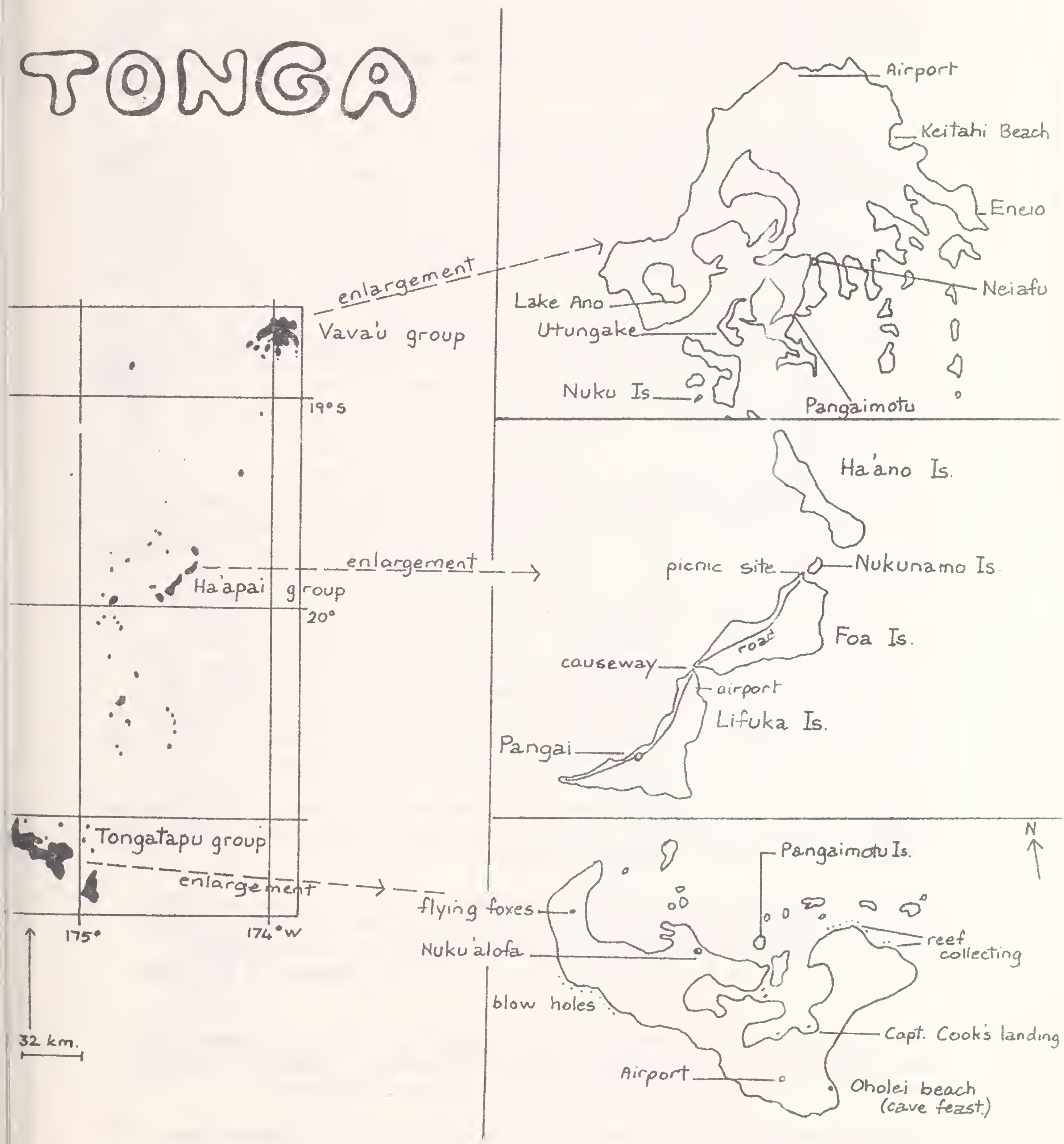
VAVA'U

Unlike the trip to Ha'apai, our flight to Vava'u was mostly through cloud and I kept thinking how huge the Pacific was and how tiny was the island we were heading for. But somehow the pilot found it and brought us safely down - to pouring rain! No one there to meet us so we finally got ourselves onto the back of an open truck, sitting on wooden benches. No one thought to let the plastic sides down until we were all thoroughly wet. When we got to the Guest House we learnt that the owner had taken the bus to meet us but was told we weren't on the plane, so he came home!

Next day we were going to do our shelling locally, because the low tide was rather early. Stan had been given directions to get to the nearest beach, which sounded pretty simple except for one small problem. We were to take the path running up near the fence and then turn right at the horse! Unfortunately the horse had moved, as they have a habit of doing, and we got a little lost. However we managed to get down to the waters edge and did some surprisingly good shelling, especially Renee Kindleysides who found several very nice Cypraea.

In the afternoon we went on a tour of the island. We reached Lake Ano, a very deep fresh water lake, and Margaret and Stan volunteered to try to find fresh water mussels. This all got slightly hysterical when we realised there were three very large spiders almost overhead - Anne's remark that "it's a monster" didn't encourage Margaret at all. From there we went through the land used as a farm school to teach the young Tongans how to improve their land mangement. This part of Vava'u is volcanic, very high, and we could see many little islands whose cliffs were so nearly vertical that it was unlikely anyone could land on them. I think it was from one of those that the Placostylus came because there would be no pigs there. Our last stop was at Keitahi beach, which we were told was one of the places parties from cruise ships are taken to for an "island feast". Certainly it was ready for them - one iron outdoor toilet and a pandanus mat screen for a changing shed. It's a small world and I found a woman at work who had actually used that changing shed when she went on a cruise - she recognised the photo.

The next day, after some typical Tongan delay (you never really find out what happened), we were taken to the beach near a village called Pangai Motu. There was an enormous sand flat area - so big that there seemed to be very little life in the middle, but in other parts, and on the


TONGA
enlargement
Vava'u group
19° S
Ha'apai group
enlargement
20°
Tongatapu group
enlargement
175°
174° W
32 km.
Airport
Keitahi Beach
Eneio
Neiafu
Lake Ano
Utungake
Nuku Is
Pangaimotu
Ha'ano Is.
picnic site
Nukunamo Is.
Foa Is.
road
causeway
airport
Lifuka Is.
Pangai
N
Pangaimotu Is.
flying foxes
Nuku'alofa
reef collecting
blow holes
Capt. Cook's landing
Airport
Oholei beach (cave feast)

reef at the outer edge, we were able to find some treasures. From there we went to Utenaki, where some friends are developing a tourist facility. Utenaki was a glorious spot, right opposite the very deep channel where the cruise ships anchor. Snorkelling in the clear water got one member of the party so excited she really didn't want to come away - although she paid for her pleasure later when she had to clean that shell!

After lunch and a pleasant visit we hired a boat from the village next door to take us back to Neiafu. The boatman was a little boy of about 9 but he was very good and careful and we enjoyed the trip. The trek back to the Guest House was mostly up hill and this we found hard going after a fairly long day.

On another day we visited a place called Ene'io. This is another place where one island is linked to the next by a causeway, usually built in the 60's with Australian or New Zealand aid. Many of the islands are so close to each other that at low tide one can wade across, but the causeways provide all-weather access as well as access for vehicles. The reef here was very exciting - we collected more cone species than I have found before on one day. Children and young people from the village came out and assisted us very determinedly - if it had been left to them there wouldn't have been a shell left on the reef and we would have needed a truck to bring them all home. Not only are these youngsters naturally very curious about what we were doing, and very friendly, they also are very keen to practise their English - provided they are brave enough to try!

Every evening we climbed back up the hill and into the daily chore of sorting, cleaning and packing shells. The verandah area in front of our rooms was ideal for this, being relatively private and close to abundant supplies of water - this was a problem on Ha'apai where water was not plentiful. By this time we were beginning to worry about weight, swapping plastic bags but not precious containers. We had managed to buy meths, with some difficulty - you have to supply your own beer bottle and they don't have corks so they re-use the crown tops! Nancy must have made quite an impression because at one stage I found her leaning over the counter very confidentially, being given hints about how to make one bottle of meths provide 16 drinks, and _much_ cheaper than gin! She said she tried to convince the boy he should'd't drink it, but I'm not sure, and I don't think he believed her anyway.

Margaret was very lucky to be able to come back and show us what she got, because as far as we can tell she not only _saw_ a stone-fish - she Picked It UP!! Talk about innocents abroad!!

Packing to leave is never a happy occupation but it's even worse when you are trying to pack twice as many shells as you thought you had in such a way that the airport staff won't notice the extra weight. Between us we were many kilos over our limit but somehow we got away with it.

The heavy and embarrassingly smelly luggage was re-established in the same guest house at Nuku'alofa, back on Tongatapu. However, this did not deter us from collecting more over the next few days!

An afternoon spent on the reef near the royal palace produced some _Cypraea hirundo_, _Cypraea ursellus_ and _Haliotis oxina_. Against all

advise, Margaret snorkelled over the edge of the reef and found it a wonderful experience swimming over the blue void admiring the many hues and shapes of coral on the reef's edge, amongst which multitudes of gaudily coloured fish swam.

One of the highlights on Tongatapu was a boat trip to Pangaimotu Island. While snorkelling around this we saw fine dark Cypraea tigris and several Lambis lambis. Sand trails were also profitable, with a variety of Mitras and Terebras being dug up at the end of them. What with lunch consisting of crayfish salad and water melon under the palm trees, we were quite happy to camp there forever.

For the last four days we hired a mini van to do some sight seeing and to collect further afield. The various areas continued to produce some exciting shells, whilst other less available shells such as Ovula ovum were generously given to us by Tongan people we met on the reef. We puzzled the fishermen on the wharf one evening by putting down a "cominella mat". We succeeded in luring two Nassarius glans on to this admist much argument and hilarity. We never did decide how to share them between the six of us!

The two and a half weeks were ended all too soon. We forced shut our bulging wuitcases and said goodbye to friends with many promises to return.

A complete listing of species found by our party would be too lengthy to provide here. However, to give you some idea of the diversity of shell life to be found in this area, our final list consisted of over seventy bivalves and over three hundred and fifty gastropods! The following partial list illustrates some of the more common and well known families collected by our party:

Conus arenatus
aulicus
balteatus
capitaneus
catus
chaldeus
coronatus
ebraeus
eburneus
emaciatus
flavidus
frigidus
generalis
glans
geographus
imperialis
leopardus
litteratus
lividus
magus

Conus marmoreus
miles
miliaris
mitratis
mustellinus
musicus
omaria
pennaceus
planorbis
pulicarius
quercinus
rattus
retifer
sanguinolentus
sponsalis
striatus
textile
terebra
tessulatus
vexillum
virgo
vitulinus

Cypraea annulus
arabica
argus
asellus
caputserpentis
carneola
caurica
clandestina
eglantina
erosa
errones
felina
helvolva
hirundo
isabella
kieneri
limacina
lynx
mappa
minoridens
moneta
nucleus
poraria
scurra
staphylaea
stolida
talpa
tigris
ursellus
vitellus

Murex brunneus
tribulus
torrefactus
ramosus

Oliva episcopalis
annulata

miniacea

Strombus dentatus
fragilis
erythrinus
gibberulus
labiatus
lentiginosus
luhuanus
mutabilis
rugosus

Lambis lambis
truncata

Terebellusm terebellum

Terebra albomarginata
areolata
affinis
argus
babylonia
cerithina
cingulifera
crenulata
dimidiata
maculata
nebulosa
subulata
tricolor

Cymatium gemmatum
muricinum
nicobaricum
pileare
rubeculum

Gyrineum gyrinum

Charonia tritonis (juv)

Distorsio anus

A TALE IN WHICH A NEW TENT WAS INTRODUCED TO THE WONDERS OF CONCHOLOGY

by Derrick Crosby

Well - it finally arrived just before Christmas - it came in two cardboard boxes and a plastic bag, it rattled, and, it turned out to be green and brown. And so it came to pass that - after inspection - it was decided to use it do something constructive and a trip to East Cape via Gisborne was planned.

Now I would point out that we only have a small car and so by the time all the diving gear, collecting gear, food, eating and cooking utensils, tables, chairs, stretchers, tent etc was packed the car was full with about another ½ meter stacked on a roof-rack(!) and off we went, arriving in Gisborne about 5.30 p.m. on Saturday 2nd February 1985. It was hot, dusty, windy, but we found a reasonably sheltered site at a motor camp in Gisborne near the beach. By the time everything was set up, dinner prepared and eaten, there was only time for a quick walk to the beach before dark. Still the wind blew. The sea was rough and dirty and virtually nothing was washed up.

Sunday was still hot, dusty and windy. We visited many local beaches, did some sightseeing but nothing of interest was found.

Monday saw us away early and we motored up the coast to Tolaga Bay. We stopped at several beaches along the way with nothing to report, except that for much of the roadside camping is allowed and welcomed by the local authorities - a welcome and pleasant change from the attitudes further north! In calm fine weather it looks as though it should be good reef collecting - another time maybe. Tolaga Bay was hot and dusty. Nothing on the beach. Tuesday I went for a shallow dive under the wharf. It's a long swim out (650 metres approx) and seemed even longer coming back but was quite interesting out there. The wharf piles are well colonised with the usual mussels, tube worms, fishing line and sinkers etc that you would expect to find. There was also a fine colony of crayfish under the wharf. Highlights were several very nice live Cominella excoriata tolagaensis, and a nice hermit Maurea pellucida pellucida. For future reference, the wharf is built out over a substantially clean sandy area, but, looking from shore there is a sizeable papa reef with lots of weed and shell life extending from the left side far end of the wharf across the bay. Unfortunately time didn't allow exploration of the reef as it was a long way from shore without a boat. That is where the best collecting is, especially if you are diving or even snorkelling at low tide. It's only about 5 metres deep and worth a visit. Overnight shell traps could also be successful but the paddle crabs are very plentiful and prolific so special traps that exclude crabs may have to be devised to make the bait last and prevent crabs mollesting shells. Crayfish for dinner.

Wednesday was on to Te Araroa. Cooler - the wind dropped a bit - very pleasant. The next day we motored slowly out to the East Cape lighthouse, stopping along the way to collect - literally thousands of nice washup Cellana flava in just about every variation of size from small and flat to large and high, and many with black spots, lines etc. Views from the East Cape light make the steep climb worthwhile. (Staircase up provided). Not much on the beach apart from limpets, Pauas, and neritas. Went fishing off Hicks Bay Wharf - fresh fish for tea.

Friday to Lottin Point. Overcast and shortly after our arrival it rained - and rained. Nothing to report. It rained most of the day and almost all night with the rain stopping during Saturday morning. Went sightseeing. Most of the local rivers were flooding and the sea was dirty, spoiling any further diving in the area. The tent by now had proved that it was up to expectations having withstood wind and rain with no major problems at all, and it didn't mind smelly shells either! Went rockpool collecting on the low tide on the North end of Te Araroa Beach. A good area with lots of nice small shells - mostly hermit crab occupied. Highlights were Turritriton tabulatus exaratus and the most beautiful big smooth black neritas I have ever seen.

Sunday - windy again with the sea rough and dirty!! On to Te Kaha. I had an afternoon shallow dive in Schoolhouse Bay. Nothing startling. Lots of good ordinary shells including the form Buccinulum vittatum maketuense, and heaps of colonies of Rissoina sp. with both large and small specimens present in large numbers, and a large crayfish did nicely for tea.

Monday the weather had quietened down so we returned for a day trip to Lottin Point. We looked at lots of little beaches with nothing to report except rough sea. A sheltered area showed up so we looked in and found washed up another Cominella excoriata tolagaensis, Astraea heilotropium, and a lump of coral. I decided a dive here could be interesting so had another shallow dive. A few nice things including live Trivia merces, several large Cantharidus opalus, and assorted Buccinulum sp. etc. Quite worthwhile and worth another visit.

Tuesday up to Mt Maunganui. Hot and windy again. Dosinias by the million and struthalaria by the thousand washing in. All seemed to be damaged. The only things of interest were at Papamoa, where in the middle of the miles of beach in the space of about 20 metres we collected about 20 Tanea zelandica - some really large choice specimens. Nothing else worthy of mention on the miles of beach that we covered.

Thursday we headed for home via the family in Waiuku, arriving home Friday afternoon - just before the weekend rain storms broke which caused havoc around the country.

In summary, Te Araroa was the nicest place to stay with good collecting along with Lottin Point and perhaps Tolaga Bay when the weather is cooler - Perhaps November would be a better time.

POIRIERIA

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CONTENTS

EDITORIAL

For many collectors, the publication of a major work on molluscs tends to be regarded as the basis for all further labelling of specimens in their collections, and it is often reverently referred to on matters of taxonomy. This has occurred with Jerry Walls' book "Cone Shells - a synopsis of the living conidae" in which many collectors studiously mark with a tick each newly acquired species and ignore criticisms of the book or valid species proposed since the book was published.

My concern is that this is also happening to A.W.B. Powell's "New Zealand Mollusca". While this is certainly a monumental and greatly appreciated work, it does not represent the final word on New Zealand molluscs. We as collectors should be questioning and confirming Powell's conclusions instead of blindly agreeing with them, as this is necessary in order for the study of molluscs to advance. Many important discoveries have been made by amateurs, and we should always remember that the study of New Zealand molluscs has a long way to go. For instance, ecological knowledge about most shells is virtually nil, even for common species.

Scientists are still studying New Zealand shells and we should pay attention to their conclusions, as in many cases it is based on information or material unavailable to Powell. Many recent publications have been on micromolluscs which perhaps are not of much interest to most of us, but there are also a number of important papers on well known molluscs such as that of R.K. Dell on volutes discussed by P.R. Jamieson in this issue.

Hopefully some of our members will contribute to malacology in the future, and a prerequisite for this is to question existing knowledge.

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Editor

ONEROA UPDATED

by Margaret Morley

In a previous article (1) I described some of the shell species that could be found at Oneroa, Waiheke Island. Since then I have continued to visit the area several times a year, in particular making an effort to go after northerly storms. My collection from this beach now numbers 228 species.

Sieving in mud at the west end on spring tides has produced Theora lubrica, Neoguraleus lyallensis tenebrosus, Epitonium tenellum and Amalda novaezelandiae.

In crevices were discovered Leuconopsis obseleta (diagram 1) and Arthritica bifurca. Hidden away among barnacles and Xenostrobus pulex on an exposed rock space were numerous Risellopsis varia.

On separate occasions one Dosinia greyi was washed in, both shells were in good condition. Six albino Struthiolaria vermis vermis have been found. When the animal is alive the peachy pink foot glows through the pure white shell. Other wash ups have been one live Muricopsis octogonus, Nucula nitidula, Neoguraleus amoenus and single valves of Mylitus edulis aoteanus.

In May 1984 Joan Coles and I found large perfect specimens of Alcithoe arabica at low tide. The siphons were poking up through the sand and the back of the shell elevating a distinct mound. On the same day I found a large whole Offadesma angasi. Joan can testify to this as she was standing beside it at the time.

During my efforts to achieve over two hundred species, I turned my attention to microscopic shells. Identification can be very time-consuming and is often inconclusive. One of the many problems is a tiny Dentalium. A few that have been less troublesome are Philine auriformis, Rangitotoa insularis (diagrams 2 and 3), Myllitella vivens and Thracia australica novozelandica. Surprise finds in shell sand were Maoricrypta youngi and what appears to be juvenile Tonna cerevisina, 2 mm.

While collecting with Norman Douglas at Easter 1985 he taught club members how to distinguish between Tellina gaimardi and Tellina edgari. Armed with this information I found both species at Oneroa. On closer examination one "odd" Tellina edgari proved to be T. charlottae.

In August 1985 the fossils were again exposed. With more determination and better techniques than before I managed to extract and identify seven species e.g., Dosinia bensoni, Ostrea gittosina (2). These fossils are extremely friable and are only uncovered when severe flooding carves a metre deep channel across the beach. On this occasion the task was further complicated by continuous rain!

For the first time Perna canaliculus have recently become well established. Is it a coincidence that they appeared shortly after commercial mussel farming started?

Diloma bicanaliculata bicanaliculata were found alive under stones, while small Siphonaria zelandica had found a local niche on shady rocks at high tide level.

An exciting discovery was the nudibranch Phidiana milleri (3). These were most exquisite with yellow to orange heads, white body and tentacles and rich tan cerata. They were perfectly camouflaged on the Corallina officinalis. I wondered if I would have spotted them if I had not studied some at Bucklands Beach a few days before (4).

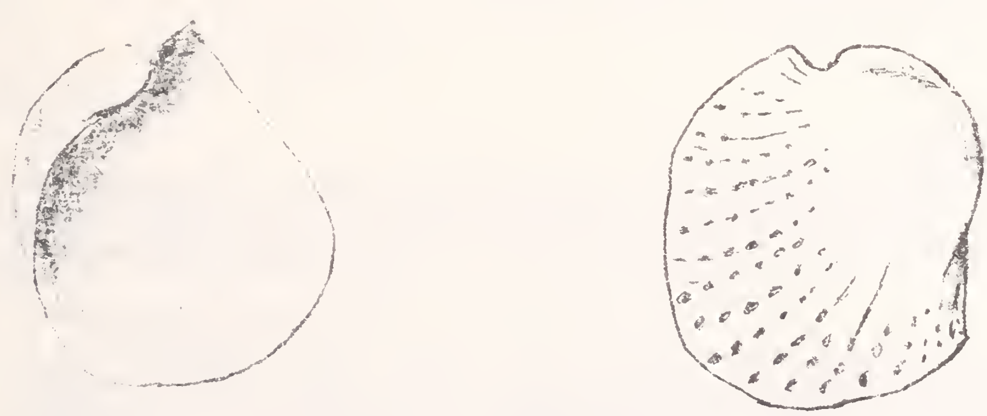
One snorkelling search added live Trochus viridus, Cookia sulcata, Cantharidus purpuratus and Mayena australasia.

I still haven't done any dredging. Free accommodation offered for experts with the necessary strength and gear.

iconopsis obsoleta Hutton 1878 Oneroa 20.9 85

3 mm
white

line auriformis (Suter) Oneroa 20 9 85



2 mm
white
thin

Rangitotoa insularis Powell 1933 Oneroa 20 9 85

1 mm
white
fragile.

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3. Marine Molluscs Part 2 Opisthobranchia
Richard Willan & John Morton P.74.
N.Z. Mollusca A.W.B. Powell as Phidiania militaris P.290.

4. What's in a Viscio physic area? M. Morley
"Poirieria" Vol. 11 Part 1. August 1981.

MARINE MOLLUSCA FOUND ON WESTERN RANGITOTO ISLAND - PART 1

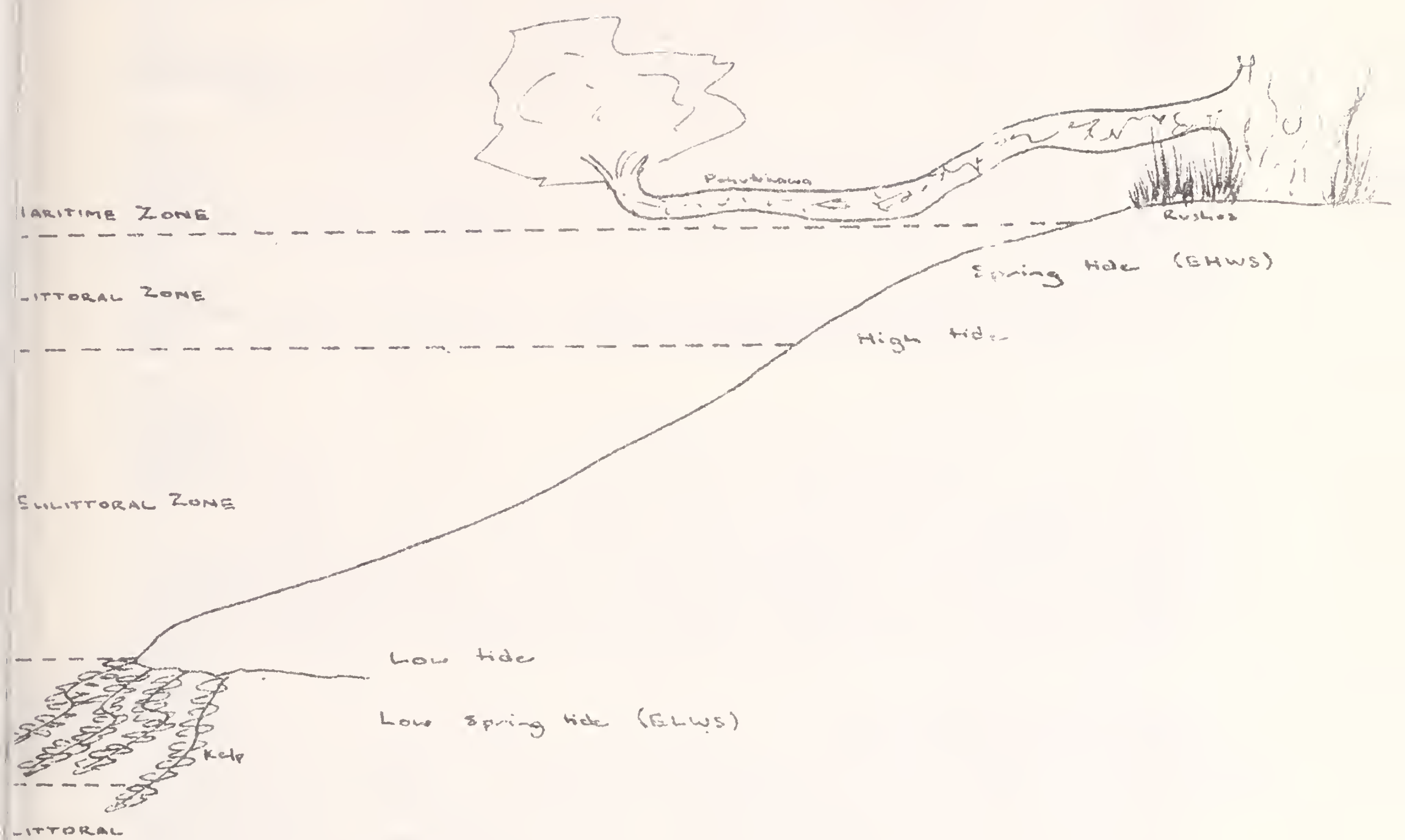
by Stephen Cook

INTRODUCTION

Rangitoto Island can easily be defined as circular, it's roughly symmetrical silhouette being a prominent feature on Waitemata Harbour's skyline. Geologists say it last erupted approximately 250 years ago.

In this article, only the western half of the island is considered. Rangitoto's western shores support a wide variety of organisms in a wide range of habitats. The northern side is semi-exposed, made up predominantly of loose boulder beaches and jagged cliffs. Mangroves are present around the southern quarter of the island. Along the western quarter, the inhabitants live in a sheltered to semi-sheltered environment, frequently in the presence of mud, silt and/or sand. There are two sandy beaches on the island. In the proximity of Rangitoto Beacon, sandbanks and mud and sand flats are exposed at low tide.

Sketch to Indicate Tidal Zones on Shore



THE HABITATS

The species have been arranged into five very general habitats and the opisthobranchs will be treated together in a separate section. No doubt, more than one or two species mentioned will fit into more than one of the habitat categories. They have been put into the habitat where the particular species were most abundant.

Some of the more obvious species are Diloma bicanaliculata, Nerita atramentosa, Littorina unifasciata antipodum, Turbo smaragdus, Thais orbita, Lepsiella scobina and Saccostrea glomerata. These are considered common and are easy to find on any suitable piece of rocky shore.

Rocky, Semi-exposed

Zeacumantus subcarinatus can be found high up on the shore.

In the mid eulittoral, under reasonably sized, smooth boulders, Atalacmea fragilis and Notoacmea daedala are common, though hard to remove in perfect condition without a thin bladed knife (and even harder to remove with a spade). Xenostrobus pulex forms encrusting mats on the surfaces of intertidal boulders.

Lower down on the shore, from the mid to the sublittoral, can be found Cookia sulcata, Trochus viridis, Eudoxochiton nobilis, Thoristella oppressa, and very occasionally, usually after rough weather, Calliostoma pellucida. Hidden under boulders in the low eulittoral is the polished chiton Onithochiton neglectus.

In the sublittoral and SLF, the common black footed Paua, Haliotis iris lives in the cracks and crannies amongst beds of tumbled boulders.

Rocky, Sheltered, Non-silty

In the upper eulittoral, the limpet Cellana ornata is found on the tops and sides of boulders.

In the upper to mid eulittoral, Risellopsis varia can be found nestling in the multitude of holes, pits and cracks that occur in new scoria rock.

Lower down, from the mid to low eulittoral are individuals of Cellana radians. In and around the rock pools of the mid to low eulittoral, individuals of Acanthochitona zelandica and Sigapatella novaezelandiae occur. Also seen frequently under boulders is the small trochid Herpetopoma bella, with its bright cloak of red orange sponge. Occasionally Anomia trigronopsis is found, as is Chlamys zeelandona which is also often encased in sponge. Under large boulders and beneath ledges and overhangs, individuals of Scutus breviculus can usually be found.

Rocky, Sheltered, Silty

Silty, sheltered areas are those where there is a thin layer of silt settled on rocks or where the silt is often suspended in the water column. These places are generally near areas of mud type substrates. About the middle of the eulittoral zone, Diloma zelandica is common under and around boulders. The homing, pulmonate limpet Siphonaria sp. (the taxonomy appears confused) is easy to find crawling around upon algae or algae covered rocks. Encrusted adults of Sypharochiton pelliserpentis are often seen in the mid eulittoral. Towards the low eulittoral, uneroded juveniles of S. pelliserpentis are found either on or under boulders. Also found under boulders, in the mid to low eulittoral zone are Diloma subrostrata, Buccinulum vittatum and the two Cominellid whelks, Cominella virgata and C. maculosa. Found around the bases of boulders and in holes and crevices in the large predatory whelk Haustrum haustorium. Hidden under boulders are individuals of the chitons Amaurochiton glaucus and Ischnochiton maorianus. Frequently found encased in sponge are individuals of the small, often colourful, fan shell, Chlamys zealandiae.

Low down on the shore, in rock pools and under boulders can be found Modiolarca impacta in its nest of byssus threads, the amazing swimmer Limaria orientalis, along with Barbatia novaezelandiae, Mytilus edulis aoteanus and Lamellaria ophione. The two slipper limpets Maoricrypta monoxyla and M. costata are often found hitching a ride on the shells of other molluscs. Commonly on Turbo smaragdus, Mytilus edulis aoteanus, in the apertures of empty whelk shells and also on the bare rock. Beneath rocks with a host of encrusting animals such as sponges, bryozoans and ascidians are Tugali elegans and the smaller Tugali suteri. T. elegans is too big for its shell and its body spreads out radially

from underneath it. It hangs, tenaciously, onto the rock surface with it's large foot, making removal sometimes difficult if you are not fast enough or not aided by a knife.

With a bit of searching, specimens of Muricopsis octogonis and Trochus tiaratus can be found. Low down on the shore, the elegant, delicate Daphnella cancellata may be picked up.

The chitons Notoplax violacea, Terenochiton inquinatus, Cryptoconchus porosus and Rhyssoplax spp. can be found in the low eulittoral, extending into the sublittoral fringe and sublittoral. Under rocks that are sitting on the mud, or very near to it, individuals of the small white bivalve Hiatella artica are usually found. Cleidothaerus albidus is sometimes seen, also at low tide. During a reasonably low or spring tide, specimens of Cabestana spengleri may become accessible. They sit around the sides of boulders and under ledges, generally at and below low tide.

Sandy

A lot of shells found in the sandy areas were shells that were picked up on the drift line and put into this category after consulting references. Commonly found on MacKenzies Beach, are the bivalves Gari lineolata, Soletellina siliqua, Tellina (Peronidia) gaimardi, Dosinia anus, D. subrosea and occasionally Zenatia acinaces. Further east, along the coast, is Whites Beach where there are relatively large numbers of eroded Pecten novaezelandiae, Alcithoe arabica, A. swainsoni and Glycymeris laticostata. Also found on Whites Beach, but in good condition, are individuals of the common turret shell Maoricolpus roseus. On the western coast, is another small shell beach, that is known by a name only 'locally'. It is excellent for finding small shells such as Myllita stowei, Leptomya retiara, Divaricella huttoniana, Felaniella zelandica, Zegalerus tenuis, Marginella pygmaea and Zeacolpus pagoda. So far, four different species of wentletrap have been found there also. These are Cirostrema zelebori, Epitonium tenellum, E. minora and E. jukesianum. Buried in the sand, sometimes with a small amount of silt, at and below low tide is the bivalve Venerupis largillierti.

Sand and Mud Flats

On sand and mud flats, the most numerous species are the two bivalves Chione stutchburyi and Paphies australis. The horn shell Zeacumantus lutulentus is also abundant and is often seen bulldozing a trail through the substrate. Also commonly seen in this environment are the Speckled Whelk, Cominella adspersa and the Mud Whelk, C. glandiformis. Empty shells of Struthiolaria papulosa are frequently seen but are usually damaged. The two small bivalves Corbula zelandica and Nucula hartvigiana, can be found live in fine mud/sand substrates. The shells of Gari stangeri can also be found in large numbers. In suitable habitats, the typical bird-footprints, left by individuals of Tellina (Macomona) liliana are easy to spot.

In muddy substrates, that generally have a greater silt content are Struthiolaria vermis, Amalda novaezelandia, A. australis and the large Horse Mussel, Atrina zelandica.

Two pulmonates gastropods that are hard not to find, live directly on the mud. One is the herbivorous snail Amphibola crenata. The other is the rubbery, pulmonate slug, Onchidella nigricans, which grzes upon the film of organic matter that settles, as the tide recedes, on the firm, dense mud around the rocks.

Littoral Zone

High up in the littoral zone, four small pulmonates, belonging to the family Ellobiidae, are found. Restricted to an area near the wharf is Rangitotoa insularis. The other three are found on any other suitable piece of coastline. These are Leuconopsis obseleta, Ophicardelus costellaris and Marinula filholi. A few specimens of Latoniella (Dardinula) limbata were also found. Usually found in association with R. insularis are Suterilla neozelanica and Notosetia sp.

Opishobranchs

Some of the opisthobranchs seem to come, and then go again, from year to year, even month to month. In May 1983, there were large numbers of Aphelodoris luctuosa, sitting mainly on the brown algae that occurs in the sublittoral fringe. By August of the same year, not one could be found, and they have not been seen in that particular place since, though they can be found under boulders in rock pools in other places.

Two specimens only of Chromodoris amoena were seen in January 1983, crawling over low tidal rocks. One Chromodoris aureomarginata was seen in December 1981 while diving for paua. Two species of pleurobranch are frequently seen. These are namely, Berthella ornata, and more commonly, Pleurobranchaea maculata. Found under boulders, in rock pools of the mid to low eulittoral, are the two nudibranchs Alloiodoris lanuginata and Dendrodoris citrina. D. citrina being more common. Seen while diving, on the surface of a large boulder in 6-8 ft of water, under a stand of the kelp Ecklonia radiata, was one specimen of Archidoris wellingtonensis. Two aeolid slugs have so far been found. One has not been identified as yet. The other is Phidiana milleri which has been found under boulders in rock pools of the mid to low eulittoral and also under the causeway, constructed by prisoners, near the wharf.

A few specimens of Bulla quoyii have been found crawling over muddy substrates, just below low tide. Individuals of the White Bubble shell, Haminoea zealandiae are found crawling along the surface of thin silty-mud in a shallow pool. Though cut off from the action of the sea by a high boulder bank, tidal seepage still occurs. Specimens of Rangitotoa insularis were also found in this same pool.

Thanks must be given to Karen A. Tricklebank for helping me to look for animals and correcting many of my mistakes. To Andrew Jeffs for his assistance in helping me iron out the 'bigger bumps' and hiccups in the first few copies.

Also to Steve O'Shea for suggesting the inclusion of the diagram.

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SPIRITS BAY

by Derrick Crosby

Over the years Ann and I have visited Spirits Bay on many occasions. We usually watched the waves roll in and break on the beach or swirl around the island and wish if only it were calmer it would be a good place to dive and have a look around.

Well on the 6th June (Queen's Birthday Weekend) we visited Spirits Bay and to our great joy it was calm, just the smallest wave onto the beach, and sunny as well, water clear - everything just right, so on with diving gear, and the exploration began. For those of you who haven't been there recently the island is in fact joined to the shore by a semi-sand covered reef which is high and dry most of the time. The island area would be about 500 square metres (1/8 acre) more or less. It appears to be mostly volcanic origin, covered with flaxes, etc. I decided to enter the water on the western side of the island and to swim around the island in fairly shallow water to simply survey the substrait and get some idea of what it all looked like.

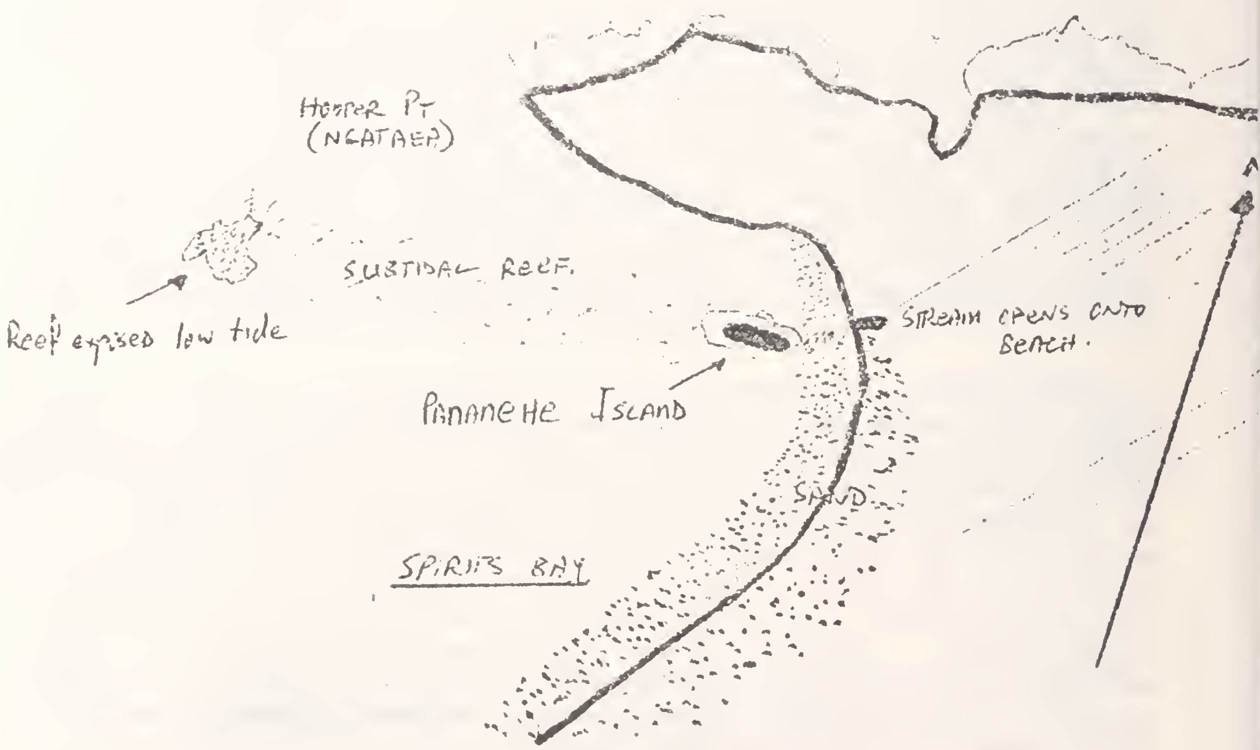
At first it was just an extension of what can be seen at low tide until I was away from the influence of the sandy beach. The water is only a few metres deep with rocks down onto sand. The rocks are all weed and kelp covered with the usual turbo and like species around. I proceeded on out from shore with the terrain not changing much until about 100 metres from the beach heading around the island about 10 metres out from the edge of the island. I would comment that the island drops more or less straight down into the water with no sand or beach except on the landward side. At about 100 metres out the substrait starts to change with more large boulders, less weed, but much more sponge and allied growth. Fish of untold species abound, crustacea aplenty, along with a much wider variety of mollusca including some very nice maureas, buccinulums, haliotis, and many, many others.

I swam around this area for a long time - only about 6 metres deep and beautiful. This reefy area appears to head on out to sea to another reef further offshore. I didn't go that far - another day maybe. This wonderful area was about the width of the seaward end of the island - enough time here - air is getting low and still a lot to look at. This area would make a good dive on its own.

Now around to the eastern side of the island and starting the swim back towards shore. Gradually the weed and kelp as seen on the other side returned, although the eastern side seemed to be more affected by swell and the kelp growths reflected this with more large type kelps and things that grow in rough water. 100 metres to go and the air runs out - ah well, snorkel to shore and just watch the passing parade below.

From my observations diving in this area would be most productive straight out from the island. To save a long swim you can walk - at low tide - around the tidal platform around the island and enter the water just a few metres from this wonderful reef area.

A final comment - it's an area that is as lively and colourful as Poor Knights - it would be nice if it stayed that way for future generations to enjoy. Perhaps the difficult weather in the area is nature's way of protecting it.



TAXONOMIC CHANGES FOR SOME NEW ZEALAND VOLUTES

by P.R. Jamieson

For most collectors familiar names die hard. Judging by the continued use of certain Volute names by collectors, a paper by R.K. Dell (1978) has either gone unnoticed or has largely been ignored. Perhaps Powell's comments on page 498 of his Manual of New Zealand Mollusca hasn't helped convince collectors to update their nomenclature. That is, those of us lucky enough to have the rare species concerned in our collections!

Dell's paper entitled "Additions to the New Zealand Recent Molluscan Fauna with notes on Pachymelon (Palomelon)" is an important one for us all to consider. Not only for the interesting additions to the New Zealand fauna (summarised by Powell in the above reference), but because it includes some major changes in the taxonomy of one of the most popular families, the Volutidae. It is these changes that I feel deserve a much closer examination. To summarise Dell's findings:-

1. Dell described a new species - Alcithoe flemingi, named in honour of Sir Charles Fleming.

2. Dell relegated Pachymelon (Palomelon) to the synonymy of Alcithoe.

3. "Pachymelon" wilsonae, smithi and grahami were all shown to represent one species with Alcithoe wilsonae being the name to be used for this complex of forms.

4. Alcithoe lutea was redescribed from additional material from off the west coast of New Zealand.

Let's start at the first point, the description of Alcithoe flemingi. Powell commented in his manual (p. 498) "If Dell's criteria are strictly applied then flemingi could well be considered a slender varient of wilsonae." If shape were the only major difference between the two species, then there could well have been some truth in that statement. However there are at least three constant major differences between A. flemingi and A. wilsonae:-

1. The narrow outline and tall narrow spine

2. the lack of an axillae indented siphonal notch

3. the very elongated protoconch.

Alcithoe flemingi Dell, 1978

- Tracing of paratype
95·7mm x 28·0mm

In shape alone A. flemingi differs markedly from all known recent species of Alcithoe. A. wilsonae, despite its many forms never comes close to flemingi in shell shape. Alcithoe flemingi is well represented in both the National Museum and Oceanographic Institute collections, and is perhaps remarkable in its consistency of form.

The lack of a siphonal notch in A. flemingi is a character unique among recent Alcithoe species, and suggests differences in the siphon of the animal.

The elongated protoconch is also important. Because the protoconch is formed within the egg case, it is not subject to environmental conditioning, and therefore is an essential element in species determination. Alcithoe flemingi's tall protoconch contrasts markedly with the bluntly rounded protoconch of wilsonae and other related species like larochei and lutea.

Besides these major differnces, other characters also help separate flemingi from wilsonae - sculpture, shape of the outer lip and the bright orange brown aperture of flemingi. The latter is perhaps the only thing of beauty this species possesses, as the surface is invariably chalky white with the outer layer largely eroded even in living specimens.

Regarding the issue of the synonomy of Pachymelon (Palomelon) with Alcithoe, I can do no better than to quote directly from Dell's paper - "In 1963 I wrote - As more deep water species of Volutes are recorded from New Zealand the distinction between Pachymelon (Palomelon) and Alcithoe becomes more difficult to maintain. The only general distinguishing character that now remains to separate the two groups is the lack of a distinct fasciole in Pachymelon (Palomelon). In some specimens of Alcithoe larochei Marwick the fasciole becomes almost as diffuse as it is in the species attributed to Pachymelon (Palomelon). Now that specimens of lutea can be compared to larochei, and with the many additional deep water forms of Alcithoe in the collection of the National Museum it becomes obvious that any attempt to maintain a generic distinction on this character is unwarranted" (Dell, 1978, p.170-171).

Therefore the species previously attributed to Pachymelon in Powell's manual should now be named as follows:-

Alcithoe wilsonae	(Powell, 1933)	(= smith, = grahami)
Alcithoe lutea	(Watson, 1882)	
Alcithoe fissurata	(Dell, 1963)	
Alcithoe benthicola	(Dell, 1963)	

However, Alcithoe benthicola still requires additional study as its protoconch is radically different to all other New Zealand species of Alcithoe.

A further point in favour of this generic synonymy is the radula of the various species concerned. Dell stated and Powell agreed that "before the systematics of the recent species of Alcithoe can be stabilised it is highly desirable that anotomical features including the radulae of

all the New Zealand forms should be studies". (Dell, 1978 p.173).

Of the species so far figured (arabica, jaculoides (as johnstoni), wilsonae, flemingi and lutea), all are similar in general form, and any differences are of no more than specific value.

Thirdly, the evidence behind the synonomy of Alcithoe smithi and grahami with Alcithoe wilsonae. It should be remembered that when wilsonae, smithi and grahami were described very few specimens were known, only one specimen each in the case of grahami and wilsonae. At that stage each of the three nominal forms appeared distinctive in their own right. But as it is often quoted to me - 'we all know how much common species vary (e.g. Alcithoe arabica, Thais orbita), so shouldn't we also expect rare species to vary as well'??

Over the years of deep water dredging the National Museum has been able to accumulate a considerable quantity of specimens referable to the wilsonae complex. Enough to be able to make a more realistic assessment of the variation of this species. We are all familiar with the fact that Volutes in general are inherently very variable. Undoubtedly this is because they are direct developers. That is, they have no planktonic stage and live in the area in which their eggs were laid. Therefore, the possibility for Volutes to disperse is minimal, resulting in characteristic populations in relatively small areas. Also, Nanism or dwarfing is a well documented characteristic of the Volutidae worldwide. The few individuals that conform to the type of "grahami" should be considered a dwarf form of the species wilsonae, as besides size there is no other difference.

Again I quote from Dell's paper - "Extensive collections in the National Museum indicate that only one species should be recognised, and that the limits of variation of this one species are wider than even the parametres of the three nominal forms would encompass". (Dell, 1978, p.171). This is a very important point. There is complete overlap in all characters - height, width, spire height and sculpture, and all forms occur over much the same geographical range.

Dell suggested that it could be convenient to use form names for the major varients. However it should be remembered that form names have no scientific recognition under the zoological code. Dell also pointed out that there will still be many individuals which do not fit easily into the three named forms. So all things considered it is best to forget the names smithi and grahami and let's all get used to the idea that wilsonae is the correct name to use.

Finally, a quick word on Alcithoe lutea. This species was redescribed and shown to be closely related to larochei. Alcithoe lutea is the type species of Palomelon, and it was the study of these shells which lead to the obvious conclusion that separate generic distinction was unnecessary. Alcithoe lutea differs from larochei in its much larger protoconch, narrower spire and more rapidly expanding body whorl.

In conclusion I would like to acknowledge Bruce Marshal , National Museum of New Zealand, who has helped considerably in my understanding of New Zealand Volute taxonomy, and also for his helpful comments on this article.

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AN EXPERIENCE ON THE GREAT BARRIER REEF

by Irene Kindleysides

In July, a group of six, all keen conchologists, set off for Queensland on a "shelling" holiday, with high hopes of finding shells that were new to our collections. The areas we visited were Cairns and Townsville, and the coast between these two cities.

Though we had all previously visited an island or two on the Great Barrier Reef, we had never before landed on a reef that was not part of an island, and uncovered only at spring tides, dead low water. This opportunity presented itself while we were there, and we were keen to take it. On July 31st there was to be a special "shelling" trip to Inner Rudder Reef, three hours by launch from Port Douglas, north of Cairns. A permit had to be obtained from the Queensland National Parks & Wild Life Service, as the Great Barrier Reef is now a National Park. A limited number of shells, two only of any one kind per person, is allowed to be taken, and these must be for private collections, and not for sale. Giant clams, bailer shells and "triton" trumpet shells are not permitted to be collected.

We set out from Port Douglas at 9 a.m. on the 48' launch "Aurora". It was a fine sunny day with only a slight wind from the South East. It was the calmest day we had when in the Cairns area, as the S.E. trade winds are constant and strong this time of the year. It was the only day this year, that the skipper had not had to use stabilizers when going out on a "shelling" trip. The three hour trip passed pleasantly, getting to know the six other collectors, sailing pastthe Low Islands with their tall lighthouse, past Schnapper Island, and watching dolphins at play. Then in the distance, a long line of breakers came into view - Rudder Reef, seeming to stretch the whole width of the horizon. As we got closer and the colour of the water changed from dark blue to varied shades of green, the Captain and mate had a busy time, one steering, the other aloft, picking their way carefully between the coral heads. Finally we anchored in clear aquamarine water. About 100 metres away, a small island of sand had emerged. The water here was calm, but the waves were breaking constantly on the outer edge of the reef and sending up showers of spray. We were ferried to the sand, in a ten foot aluminium dinghy and then set off towards the higher,rockier part of the reef, wading through water up to our knees. We wore basketball boots to protect our feet and ankles. There were many types of coral, stagshorn, brain, mushroom, etc. and I passed several giant clams with their valves partly opened. These were 2' to 3' across. I was careful not to step into these.

We were thrilled to find some nice cone shells, but cowries were few. Strombus shells, the "spider" Lambis lambis and the red mouthed S. luhuanus were there in plenty, very beautifully coloured, and four of the largest "Spiders", Lambis truncata, were found, but not by our party. I picked my first live pearl oyster. In the sandy areas some olives and terebra were found. We saw plenty of the colourful reef fish, mostly small; a handsome striped sea snake; and a large green and yellow eel.

A call from the experienced ones told us the tide was now coming in fast, and we were well away from our sand island. We made towards it, now having to wade through water up to our waists to reach it, not so easy, when stumbling round coral and rocks, and holding on to one's "finds".

It was good to be back on board the launch, to get into dry clothes, and enjoy a cup of coffee. It was now late afternoon and getting cool.

A list of the shells we had gathered was made out by the skipper to hand in to the Authorities on the way back. We watched the sun set, and a beautiful full moon rise. We arrived back at Port Douglas about 7 p.m., tired, but very pleased with our day's adventure.

EARLY DEVELOPMENT OF CALYPTRAEIDAE

by Margaret Morley

While looking through shell sand under the microscope I noticed an unusual shell with a wide aperture. Was it a wonderful rarity? After much fruitless book searching this specimen followed numerous predecessors onto a top shelf for future identification.

At a later date I spotted several similar microscopic specimens from Oneroa but they were not all quite the same. The underoides were mostly damaged then one gave me a clue showing a suggestion of a shelf. Over a period of time many were collected. A close look at a series of increasingly mature shells confirmed the following species Maoricrypta costata, Sigapatella novaezelandiae and Zeguraleus tenuis.

In shells of the usual size in collections these early beginnings are eroded away.

If anyone else has studied juvenile shells in this family I would be interested to hear if my conclusions are valid.

ITEMS OF INTEREST

- Musculista senhousia, the small Asian mussel, whose arrival in New Zealand waters was recorded by Dr Richard Willan in "Poirieria", Vol. 14, No.1, is obviously spreading. Kevin Burch discovered it in Jackson's Bay, Whangarei Harbour; and Frank and Verna Johnson confirmed that it was breeding in that locality.

- Little has been published on the occurrence of albinism in New Zealand molluscs. Part of the reason why may be because of the difficulty of separating faded beach specimens from true albinos. One species, Dosinia anus, occurs in albino form on Ninety Mile Beach. On my vist to this area I found albino specimens outnumbering regular coloured specimens by about twenty to one. I can offer no convincing reason as to why this should be the case. Recently Margaret Morley found her second specimen of an albino Struthiolaria vermis on Waiheke Island. Albino specimens of Maurea punctulata from Southern New Zealand have been displayed at club meetings. Further records of this property would be welcomed.

- Conus collectors were excited recently by the finding of a specimen of Conus kermadecensis sitting on its egg cluster, thus confirming that this species is breeding in New Zealand waters.

Maoricrypta costata (Sowerby 1824)

1 m.m.

apetella novaezelandiae (Lesson 1831) *Zegalerus tenuis* (Gray 1867)

0·7 m.m.

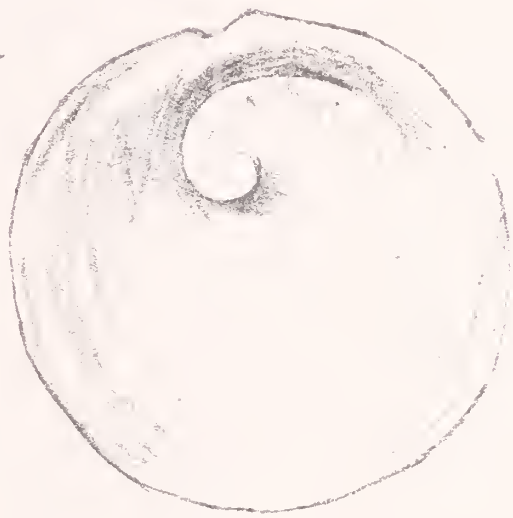
1

0·5 m.m

2

1·2 m.m.

2

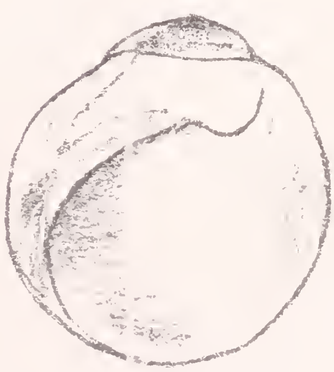


1 m.m.

3

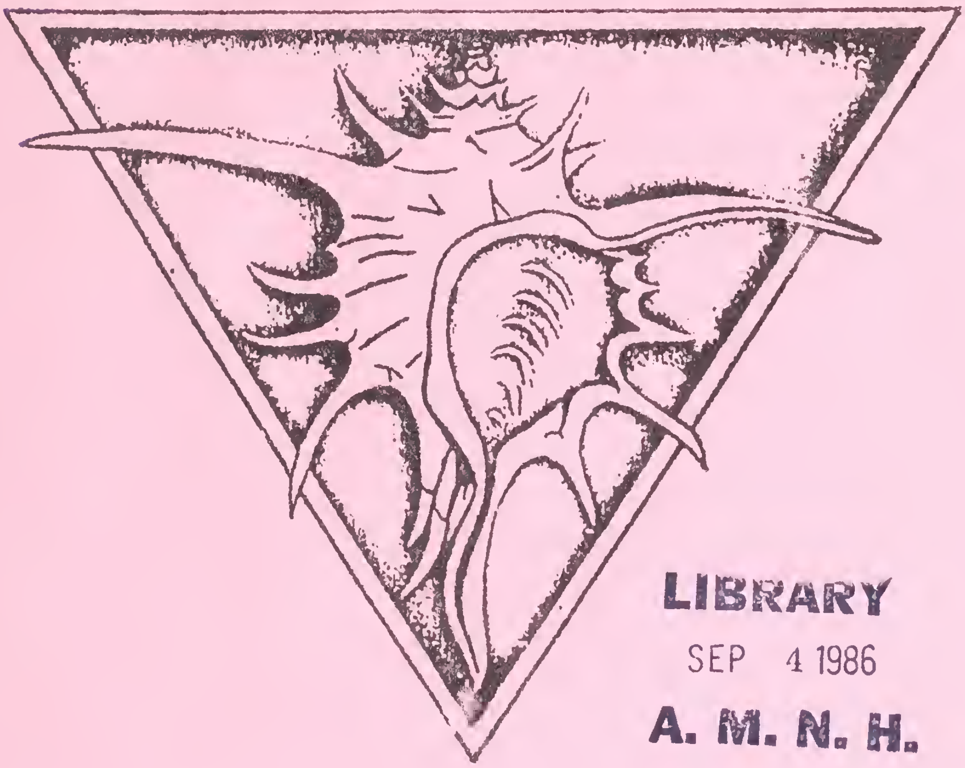
0·7mm

3



0·5 mm

POIRIERIA



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CONTENTS

EDITORIAL

The Editor was mildly reprimanded for the use in the last issue of shell names that have changed in recent years. While the constant changing of shell names can be bewildering, I feel that we as collectors should be trying as much as possible to assimilate new names and use them appropriately. To assist you with learning these new names (and then hopefully using them!) Peter Jamieson has agreed to write a regular article informing us of these name changes, starting with an article correcting some of the errors made in the last issue and giving reasons for the changes. Other changes that have occurred in the Ranellida (formerly Cymatiidae!) were detailed in an issue last year. A method I personally use to remind me of these changes is to pencil them in my copy of "New Zealand Mollusca" alongside the old name so that they stare me in the face whenever I refer to that species. However, I can also sympathise with members who say they have a hard enough job identifying their specimens without having to search for the correct name as well. In the final analysis some of us will be scientific collectors and thus place importance on using the correct scientific name; while others will be content to give their shells a label which means something to themselves, even if that label only says "common bubble shell".

Ian Scott
25 Halston Road
AUCKLAND 4

Editor

THE CLIMBING BIVALVE

- by Margaret Morley

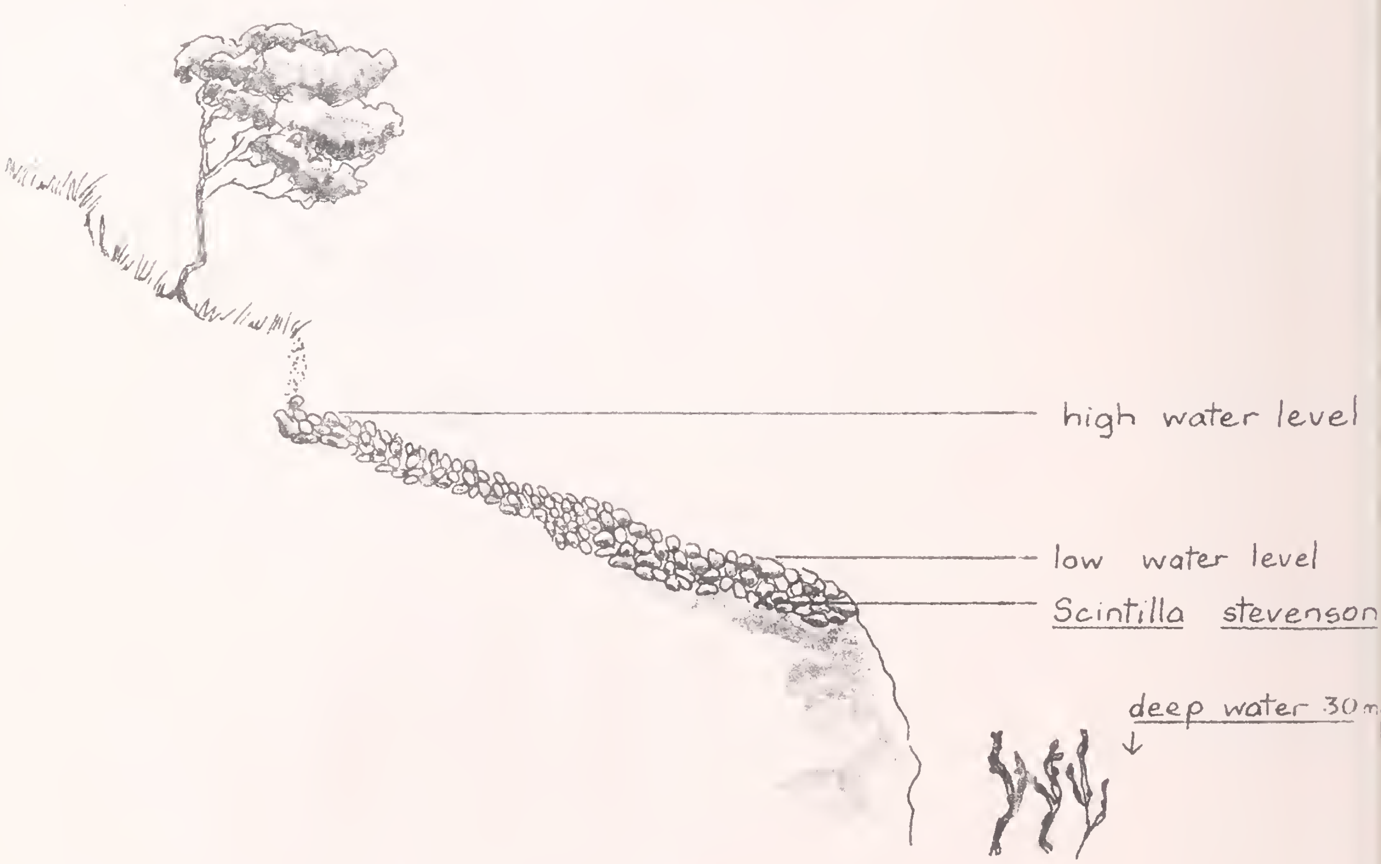
During a sailing holiday in December 1985, my husband and I anchored in Whangaparapara on Great Barrier Island.

The water was wonderfully clear, so I lost no time in putting on my wet suit and going snorkelling. I turned over large smooth boulders close to the beach. These were lightly welded together with colourful sponges and encrustations, although water was still able to flow inbetween. It was necessary to turn a lot of stones as the best finds were several layers deep. (See profile Diagram 1).

angaparapara. Great Barrier Island

12 85

1



There were large Cordita asteana, Hiatella arctica, Sigapatella novaezelandiae and Maoricrypta costata. Suddenly I noticed a small mauve tinged bivalve, then another. These were later confirmed to be Scintilla stevensoni.

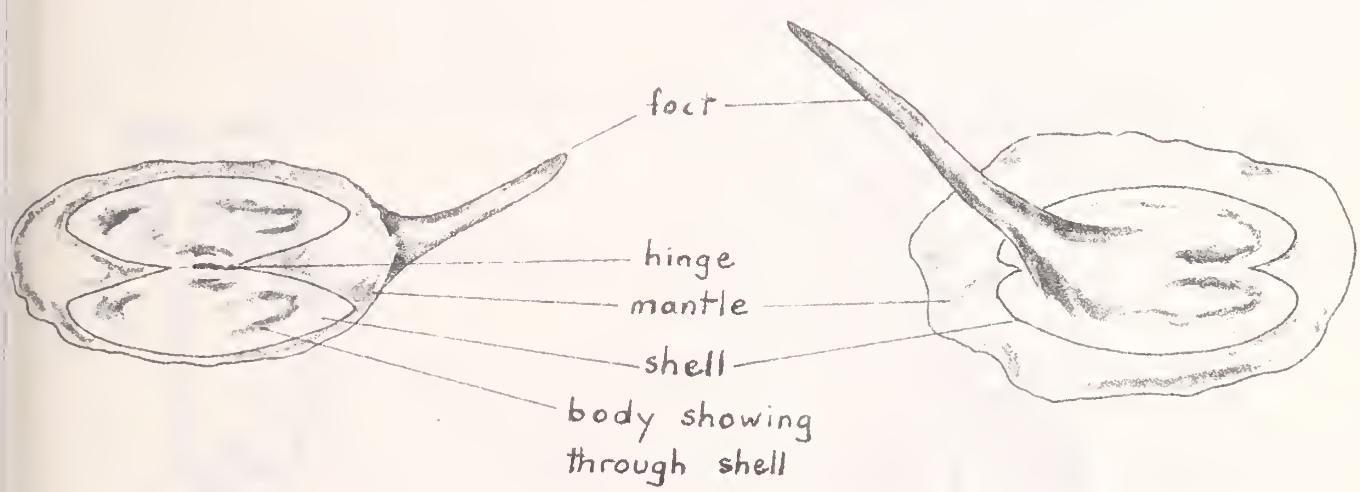
The shells ranged in size from 6-9 m.m. They were thin, shiny, white and transparent. The mauve tinge was most noticeable on the larger specimens. Family groups of 2-4 were found because the young develop within the mantle cavity of the adult.

Back on board I watched Scintilla stevensoni crawling in a container. The animals were transparent white. They looked similar to a cowrie because the valves were opened out to 170° and the foot extended in front. (Diagram 2). When turned over you could see inside (Diagram 3). If disturbed the valves snapped shut. The angle of the valves when extended can be seen from each end (Diagram 4). Diagram 5 gives the most accurate idea of the shape because in the other views it is being seen partly edge on.

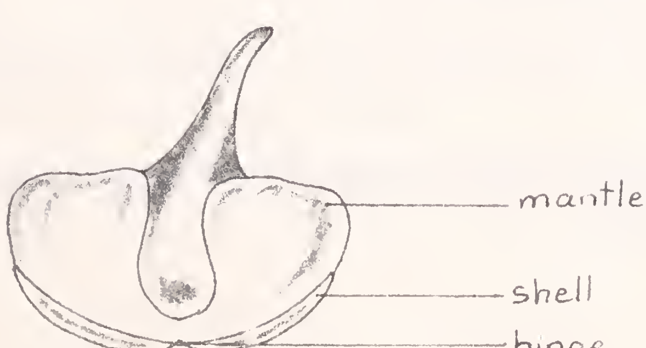
cintilla stevensoni Powell 1932

FROM ABOVE

3 FROM BELOW



4 FROM ONE END



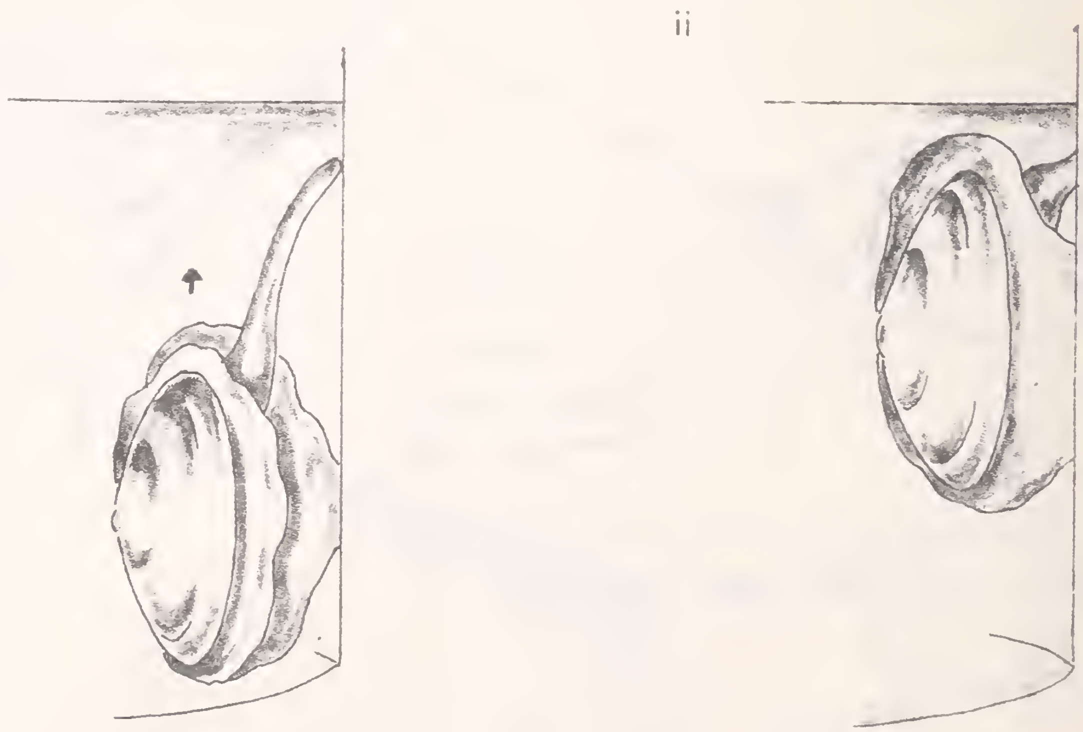
The extendable foot was used to pull the shell up the side of the container as far as the surface of the water. (Diagram 6). This intriguing ability for a bivalve must be essential for its particular habitat. The action was quick and nimble.

These shells were difficult to clean and especially tricky to tie closed .... The hazards were exaggerated by the unpredictable movements of the yacht!

Although I made other excellent finds these Scintilla stevensoni remained the highlight of the holiday.

5 FROM SIDE

6 CLIMBING UP SIDE OF CONTAINER



Acknowledgements to Dr R.C. Willan for information on the breeding of S. stevensoni.

KEEPING UP WITH THE NAMES'S (A REVIEW OF SOME RECENT PUBLICATIONS CONCERNING NEW ZEALAND MOLLUSCA)

by P.F. Jamieson

Since the publication of Powell's Manual of New Zealand Mollusca, much research both here in this country and overseas has occurred, with the inevitable barrage of name changes. Trying to keep up with it is a problem we all have to face. I choose the following three papers for review because they pertain to species names used in the last issue of Poirieria which need updating.

1. Studies on Conidae (Mollusca, Gastropoda) 3. Systematics and distribution of some Australian species, including two new taxa. H.E. Coomans and R.M. Filmer. Beaufortia. Institute of Taxonomic Zoology (Zoological Museum) University of Amsterdam. Vol.35 No.1, p.1-14, April 1985.

   This paper is of particular interest to New Zealand collectors because the authors discuss the taxonomy of Conus kermadecensis Iredale, 1913. H.E. Coomans is well known to serious Cone collectors, as together with two other authorities is presently involved with an alphabetical revision of all recent Conidae. A major task!!

   Conus kermadecensis is considered by the authors to represent a southern "subspecies" of Conus lischkeanus Weinkauff, 1875. A new "subspecies", Conus lischkeanus tropicensis is described. The distribution of the three "subspecies" are as follows:-

   Lischkeanus lischkeanus:- Southern Japan and Taiwan.

   Lischkeanus kermadecensis:- Queensland, N.S.W., New Caledonia, Lord Howe Island, Kermadec Islands (type), Northern New Zealand, and possibly the Gulf of Papua.

   Lischkeanus tropicensis:- Western Australia, Oman, Mozambique and South Africa. Type locality Exmouth, West Australia.

   The distribution of these "subspecific" forms is interesting. It is antitropical, centred on the tropics of Capricorn and Cancer, hence the name tropicensis.

   Walls (1979) considered Conus lischkeanus a dubious or unrecognizable species, but since then the type specimen has been rediscovered.

   In more recent literature (Marshall 1981, Rockel 1979) Conus lischkeanus and kermadecensis are considered conspecific. Coomans and Filmer prefer to treat kermadecensis as a subspecies of lischkeanus because of the following differences:-

   1. In shells of the same length Lischkeanus kermadecensis are heavier.
   2. Lischkeanus lischkeanus are very slightly more tapered.
   3. The two forms have disjunct ranges.

   These are really very minor differences indeed, and are certainly not readily noticeable when shells of the two forms are seen side by side.

It should be noted that Coomans and Filmer recorded the depth range for Lischkeanus kermadecensis as 30-200 meters, even though literature available to them recorded it alive inter-tidally from New Zealand.

The need to describe Lischkeanus tropicensis was based on the following:-

1. Stouter shape
2. Lower spire
3. Its heavier shell (even more so than Lischkeanus kermadecensis)
4. More rounded shoulder
5. Less obvious bands on the body whorl
6. General colouring less pronounced
7. Violet aperture instead of white for both other subspecies.
8. Shallow as opposed to deeper habitat

Unfortunately Coomans and Filmer did not examine shallow water specimens of Lischkeanus kermadecensis from Parengarenga Harbour, New Zealand. If they had been able to, some of their conclusions may well have been a little different. Firstly, obviously Lischkeanus tropicensis is not the only subspecies to occur in shallow water. Parengarenga shells are also lower spired and stouter, with more rounded shoulders than Lischkeanus kermadecensis from other regions. Although I have not weighed them, simply because I do not have similar sized shells from other localities, Parengarenga specimens seem very heavy. Does anyone have a 35-36 mm specimen of Lischkeanus kermadecensis from Parengarenga so I can check this out for certain?? It seems probable that these differences are ecological in nature. That is, shallow water specimens are usually heavier. Deeper water shells are lighter in weight and more elongate. This variation is well known in many species. Some Lischkeanus kermadecensis also have less obvious bands, as is aptly demonstrated by the two superb specimens from Parengarenga Harbour in the collection of Hunt and Molly Seelye. One is heavily banded, while the other is devoid of bands. As pointed out by the authors, the general colouring of Lischkeanus tropicensis is very variable, and can at times be identical to Parengarenga specimens of Lischkeanus kermadecensis.

So that only leaves aperture colouration to consistently separate Lischkeanus tropicensis from Parengarenga Lischkeanus kermadecensis, if we follow Coomans and Filmer. Specimens of Lischkeanus tropicensis in my collection however, vary from very deep violet inside the aperture to only the slightest hint of violet deep inside the aperture. I would therefore be most interested to hear from anyone who has a Lischkeanus kermadecensis from any locality, but especially Parengarenga harbour that has any colouration except white inside the aperture.

In summary:- Conus lischkeanus kermadecensis is the name to now use for New Zealand shells previously known as Conus kermadecensis.

The complex of forms of Conus lischkeanus from the Indian Ocean and Western Pacific still warrant further study and discussion. I'm sure the last word on these has not yet been said.

The important point is however, that Lischkeanus is the species concerned, and the so called subspecific names are of only secondary concern, if valid at all.

2. Redescriptions and Relationships of Siphonaria zelandica Quoy and Gaimard to S. australis Quoy and Gaimard with a description of S. propria sp. Nov. (Mollusca: Pulmonata: Siphonariidae). B.W. Jenkings. Journal of the Malocological Society of Australia Vol.6, No.1 and 2, p.1-35, June 1983.

To quote the author "While preparing a revision of the Siphonariidae it has become apparent that the identities of several Australian and New Zealand species of the subgenus Siphonaria, Dall, 1870, are totally confused in the literature. Confusion between these species is due to inadequate original descriptions based on insufficient material and subsequent lack of referral back to the type material by later workers." Jenkings, p.1.

Three species are presently still being recognised in New Zealand:-

S. zelandica
S. australis
S. cookiana

The type locality for S. zelandica was generalised to 'New Zealand', with the belief it also occurred in Australia. S. australis was originally described from two specimens from under kelp holdfasts in Cook Strait. For years it was considered that S. zelandica occurred from mid to high tide on rocks, whereas S. australis was confined to kelp holdfasts.

However, the facts unfold as follows:-

S. zelandica is endemic to Australia! The type locality was an error.

All New Zealand shells previously attributed to S. zelandica and S. australis are shown to be conspecific, with the name S. australis to be used for the New Zealand species. S. australis is endemic to New Zealand!

What then becomes of S. cookiana? The shells so called are a distinct species. However the type lot of seven specimens contained ONE juvenile of S. australis. When a lectotype was selected by Boreham (1959), you guessed it, he selected the australis! Therefore cookiana becomes a synonym of australis. Jenkings therefore provides a new name, S. propria, for the shells we have been used to calling cookiana. Type locality is lower littoral, South side of Kaikoura Peninsula.

In summary:-

	S. zelandica -	occurs only in Australia.
	S. australis -	occurs only in New Zealand. Name to be used for all New Zealand shells previously referred to here as both S. "zelandica" and S. australis.
	S. propria -	occurs only in New Zealand. The new name to be used for the shell previously known as cookiana.

Have I unconfused the confusion???!

3. The Systematic status of Auricula (Alexia) meridionalis Brazier, 1877 and Rangitotoa insularis Powell, 1933 (Mollusca: Pulmonata: Ellobiidae) in Australasia. F.M. Climo, Records National Museum of New Zealand, Vol.2, No.6, p.43-48, July 1982.

The impetus for this paper was the discovery of ellobiid snail living in a salt marsh community at Aramoana, Otago Peninsula. This snail was found to be identical to Marinula meridionalis (Brazier 1877) from South Australia and Tasmania, and also Phytia myosotis (Draparnaud, 1801) from Spain, England and South Africa. All these records are the same species, and Phytia myosotis has priority. This species owes its wide distribution to shipping.

Even more interesting is the discovery that the so called Rangitotoa insularis, Powell 1933, is also an introduced species! Some malacologists have been aware of the apparent incongruity presented by the original restriction of an endemic genus to the volcanically very recent island of Rangitoto. Examination of paratypes of a snail from Bermuda, in the Caribbean Microtralia occidentalis (Pfeiffer, 1854), has shown the two species to be conspecific. Microtralia occidentalis has also recently been reported from Easter Island and Rapa-Iti Island in French Polynesia. Another case of transportation by shipping.

In summary:-

Phytia myosotis - newly recorded from a salt marsh at Aramoana, Otago Peninsula. Introduced.

Microtralia occidentalis - the name to be used for Rangitotoa insularis, which is a synonym thereof. Introduced.

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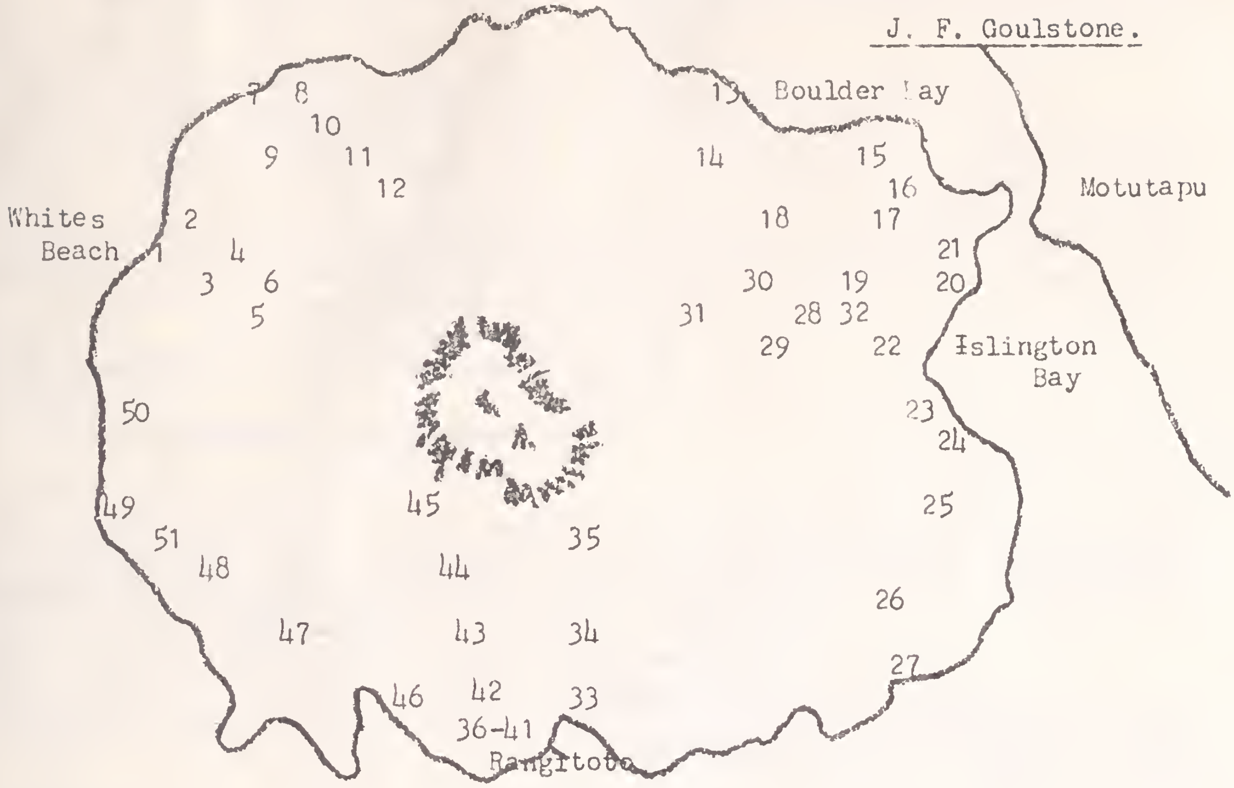
RANGITOTO ISLAND LAND SNAIL SURVEY (1976 - 1977)

J. F. Goulstone.



This survey was prompted by a desire to find out what movements had been made by the land snail populations on Rangitoto Island since the Club first investigated them in 1949. (Bulletin No. 5 - E.N & N.W. Gardner). The inspiration for this second survey came from Richard Willan who organised the whole thing but was never able to write it up. As I am now engaged in a review of landsnails in the South Auckland area it became important to evaluate this work.

Richard has willingly given me all the material together with his notes, and with some I had retained from my own part in the survey, forms the basis of this report. Some snails have been recorded as present, but the specimens cannot now be located so these I have marked with an * on the table. Also I have not seen those snails collected by Norman Gardner but have just inserted them as he recorded.

DAY 1 - RANGITOTO WHARF. (26 - 9 - 76)

J. F. Goulstone and 2 sons)
Mrs. R. Snedden and son)
Mrs. J. Pearce) -------- Sites 33, 34, 35.
Mrs. M. Morley and son)

Mr. & Mrs. N. Gardner) Sites 36 - 41
Miss J. Coles) 42 - continuous cover, considerable *Astelia*
Hamish Spencer) -------- 43 - broken areas of vegetation.
Tony Cunningham & friend) 44- many bare areas.
Mrs. M. Proffit) 45 - stunted vegetation, some Ti-tree, more or less continuous.

R. Willan) Site 46, nothing under Rewarewa leaves some under Pohutukawa
Mrs. Stanton) ---- 47 abundant amongst Mapou leaves.
Mr. and Mrs. Hole) 48
Mr. D. Crosby.) 49 quite tall *Astelias* and some very soggy areas.
50 isolated 'bush island' - 8 m. sq. - Pohutukawa, Mapou, *Astelia* *Griselinia* .
51

DAY 2 - ISLINGTON BAY (5 - 12 - 76)

R. Willan) -- --Site 19 low bush of Mingimingi, Pohutukawa & Mapou, no damp spots.
Mrs. D. Hole)
20 quite damp, Pohutukawa, Astelia , Griselinia, Mapou.
21 a few damp spots under Pohutukawa & Karamu.

J. F. Goulstone)
Miss J. Coles) ---- Sites 28 - 32 These were rocky Pohutukawa islands very dry with wide patches of bare scoria in between.
Mr. & Mrs. Rockell)
Tony Cunningham)

Mr. & Mrs. N. Gardner) ---Site 22 continuous vegetation.
Hamish Spencer)
23 continuous vegetation with rotting Pohutukawas
24 some big scoria areas.
25 continuous vegetation.
26 some scoria walls with trapped leaf litter below
27 short vegetation and some big scoria fields

DAY 3 (19 - 11 - 77) By dinghy from Takapuna

R. Willan) --- Site 15 at top of beach- Asplenium , Ngaio, Pohutukawa.
D. Crosby)
16 Pohutukawa island with Griselinia , Mapou, Astelia, Mingimingi, Lichens and Kidney ferns.
17 Pohutukawa, Mapou, Hebe , Griselinia, abundant Collospermum & Astelia .

Mrs. J. D. Willan)
Mrs. M. Morley)---- Site 13 & 14
Tony Cunningham)

DAY 4 (20 - 11 - 77). By dinghy from Takapuna.

R. Willan) -- Sites 7 & 8 Pohutukawa, Ngaio, Ferns, Mingimingi.
Bruce Hazelwood)
9, 10 Astelia, Pohutukawa, Mapou in a shady gulley. Astelia showing signs of predation.
11 Pohutukawa island with Griselinia, Mapou, Collospermum & Hebe.
12 gully surrounded by fairly mature bush - Pohutukawa, Mapou, Kanuka, Griselinia with understory of Astelia & Geniostoma.

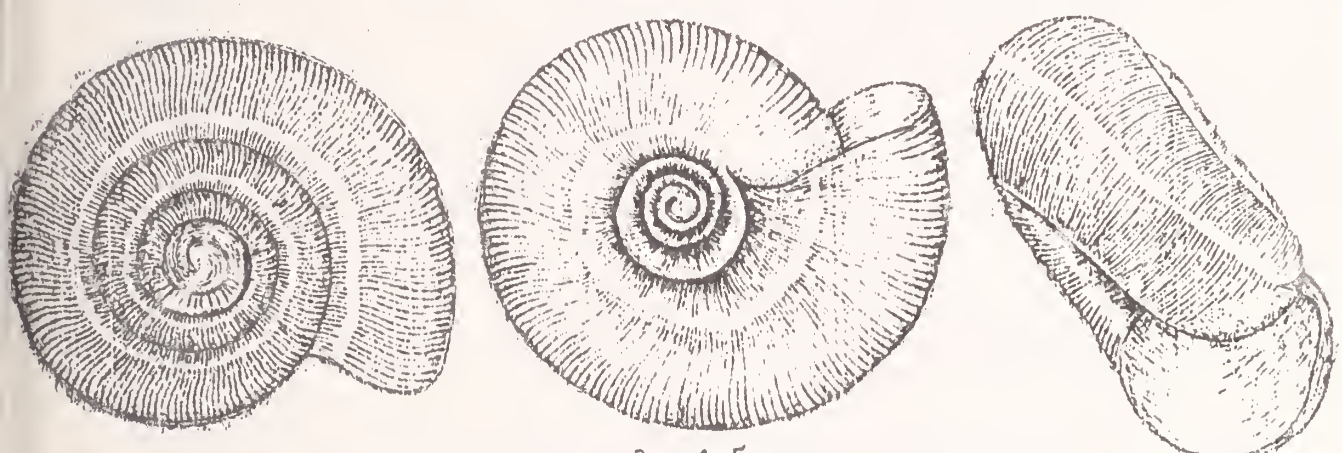
J.F.Goulstone) ---Sites 1 - 6 . Sites 1 & 2 were just behind the beach amongst Astelia. 3 & 4 were in an area of thickly moss covered rocks. Snails were found under the moss.
N.Gardner)
Tony Cunningham)

LIST OF SPECIES & COMPARISON WITH PREVIOUS SURVEY .

1976 - 1977	1949
Delos coresia (Gray, 1850)	Delos coresia (Gray, 1850)
Delos jeffreysiana (Pfeiffer, 1853)	
Otoconcha dimidiata (Pfeiffer, 1853)	
Tornatellinops novoseelandica (Pfeiffer, 1853)	
Tornatellides subperforata (Suter, 1909)	
Omphalorissa purchasi (Pfeiffer, 1862)	
Charopa coma (Gray, 1843)	Charopa coma (Gray, 1843)
Charopa pilsbryi (Suter, 1894)	
Charopa montivaga (Suter, 1894)	
Flammocharopa costulata (Hutton, 1883)	Flammulina costulata parva (Suter, 190[illegible]
Phenacharopa pseudanguicula (Iredale, 1913)	
Cavellia buccinella (Reeve, 1852)	Fectola buccinella (Reeve, 1852)
Mocella eta (Pfeiffer, 1853)	Subfectola caputspinulae (Reeve, 1852)
'Mocella' sp. 3	Mocella cogitata (Iredale, 1941)
Huonodon hectori (Suter, 1890)	Ptychodon hunuaensis (Suter , 1894)
Therasia decidua (Pfeiffer, 1857)	Therasia decidua (Pfeiffer, 1857)

Serpho kivi (Gray, 1843)	
Flammulina perdita (Hutton,1883)	Flammulina perdita (Hutton,1883)
Phenacohelix giveni (Cumber,1961)	Phenacohelix ponsonbyi (Suter,1890)
Phenacohelix pilula (Reeve,1852)	
Therasiella neozelanica (Cumber,1967)	Therasia tamora (Hutton,1883)
Laoma poecilosticta (Pfeiffer,1853)	Laoma poecilosticta (Pfeiffer,1853)
Phrixgnathus erigone (Gray,1850)	
Phrixgnathus fulguratus (Suter, 1909)	
Phrixgnathus glabriusculus (Pfeiffer,1853)	Laoma ariel (Hutton,1883)
Phrixgnathus moellendorffi(Suter,1896)	
Paralaoma lateumbilicata (Suter,1890)	Paralaoma lateumbilicata (Suter,1890)
Paralaoma caputspinulae (Reeve,1852)	
Punctid n.sp. 5	
Punctid n. sp. 29	
Punctid n.sp. 38	
Athoracophorus bitentaculatus(Quoy & Gaimard,1832)	
Arion intermedius (Normand,1852)	
Agriolimax reticularis (Müller,1774)	
Helix aspersa (Müller,1774)	
Oxychilus cellarius (Müller,1774)	
Cochlicopa lubrica (Müller,1774)	

All of these species are illustrated in Poirieria Vol. 13 No. 1 1983, but the 'Mocella' sp. 3 seems a little different here on Rangitoto as it is mainly without a colour pattern and has slightly different protoconch sculpture.



3 x 1.5 mm.

DISCUSSION.

We found 37 species on this survey compared with 15 species recorded by E.N & N.W. Gardner in 1949. The three factors which could have had a bearing on this increase are : 1. An improvement in the bush cover which has encouraged a proliferation of scarce species.
2. Introductions of new species from outside sources.
3. Improved and more extensive collecting on the 1976 - 1977 survey.
I believe the third factor has been the most influential but undoubtedly the other two have played a part. Introductions from outside would involve the "introduced" species A. intermedius, A. reticularis, H. aspersa, O.cellarius, C.lubrica & the natives T. novoseelandica, T. subperforata, P. caputspinulae all three of which are fairly common on coastal cliffs around the Waitemata.

The only species which failed to turn up in 1976 - 1977 was Laoma ariel . This was reported by E.N. & N.W. Gardner as being common at Boulder Bay. We did find Phrixgnathus glabriusculus in large numbers here and I have assumed that a mistake was made in the 1949 identification; Laoma ariel is a common enough snail around Auckland but not a coastal species.

As upward of 20 people were involved on the survey the results are bound to be uneven, for example the most number of species at one station was found by Tony Cunningham at 4 and R. Willan at 21, both young enthusiasts with keen eyesight. The older collectors tended to collect large numbers of the larger species.

Table 1. Distribution and abundance of pulmonates on Rangitoto Island (1976 - 1977).

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	32.	33.	34.	35.	36.	37.	38.	39.	40.	41.	42.	43.	44.	45.	46.	47.	48.	49.	50.	51.
D.coresia	2	2																																												1					
D.jeffreysiana				1																						1																									
D.dimidiata																																	2																		
E.novoseelandica	2			1									2						1																																
T.subperforata																							1																												
O.purchasi				1																																															
C.coma							2		26		6							23																												*					
C.pilsbryi			1												1																			1								3			1					2	
C.montivaga																			1															5	4																
F.pseudanguicula																										1								2																	
F.costulata		1	9	11									1																																		1				
C.buccinella										6				3				20			1			1		4						2		3	1			2				3			1					11	
M.eta	57	5					8	15		2			13	2	13		2	3	8	7	1			1		2	10							3		1										4	2			5	
[illegible]sp. 3	11	4	13	3	2	1		22					10			1			2	3		5				8			1			2	6									3		1		7	5	*		1	
H.hectori	52	1	2	5	1	2	1	17						5		2		5	35	78	21	17	2	4	63	21	36	13	5	8		4	2	3	1				1	4	4	20	1		10		*60	*	14		*10
T.decidua	29	5	2	1	9	7		3	6	4	3	10	11	8	3	9	15	15	5	2	8	3		1	6			3	6		5		22	12	13			2			1	2	6	7		1	4	*	15	5	
S.kivi																																		1																	
F.perdita				1																																															
P.giveni				2																		1												6	5															*	
P.pilula																							1																												
T.neozelanica				2																																														7	
L.poecilosticta																			25	7	14	25	59	2	17	16	3	11	9	23	12	1																			
F.erigone				1																																															
P.fulguratus				3																																			2	2	7										
P.glabriusculus	12						57	26					40		45	4								1	22		35									8															
P.moellendorffi																							1																												
F.lateumbilicata	10							4							1			7	2		1		1		9	2	19			1			1	1						1		6	5	2	5		50			5	
F.n.sp. 29									1		1		12	1					1	1	1	2	1			2	2					1	4													1	10	*	2		
F.n.sp. 5								1					3																																			1		1	
F.n.sp. 38.											1																																				2	1			11
F.caputspinulae	25						6						8						2		2									1						1										*		4	3		1
A.citentaculatus																2	2												1																						
A.intermedius												1									1															1											1			1	
A.reticularis																					1																														
H.aspersa																					1						1									3	1														
O.cellarius																					1						4									3	1	2											5		
C.lubrica																											2																								

No separate count was taken of live or dead specimens so abundance figures could be misleading as those with high counts could be snails producing heavier shells. I have not seen any comparison of dessication rates in New Zealand land-snail shells but I have no doubt that some species build heavier shells than others with the same resources. In this regard I suppose that bigger shells will persist longer than smaller ones.

However, one fact important to all snails is the amount of calcium present in their diet. All snails in lime rich areas produce heavier longer lasting shells. Also coastal areas affected by spray drift seem to give snails extra calcium and large numbers of dead shells can be observed here if the bush cover is adequate. Not all species can tolerate these coastal conditions so species numbers tend to be low. On Rangitoto apart from up around the cone, the bush seemed to colonize the coastal strip first so it is little surprise that it is the salt tolerant species which have flourished. Mocella eta, 'Mocella' sp. 3, H. hectori, T. decidua C. buccinella, P. glabriusculus, P. lateumbilicata can all be found in any number of coastal situations around Auckland. There are a few others of course some of which are present on Rangitoto but not plentiful, things like P. caputspinulae & T. novoseelandica. One can only assume they were not originally present on Motutapu.

The pattern of colonization outlined in the 1949 report, that is across the land bridge from Motutapu, must basically be correct. Birds, particularly sea birds, will have accelerated the process and perhaps . bridged some areas. They may even have brought material from further afield. Otherwise one would expect a concentration of species at Islington Bay and a falling of at the far end of the island. In fact the greatest number of native species in a sample was found somewhat inland at the far western end of the island.

A spectacular example of the slow spread from the land bridge is Laoma poecilosticta, which is present in large numbers around Islington Bay, but nowhere else. Why has this species been resistant to the accelerating processes?

When the Table of disribution and abundance is compared with a similar table from bush areas over the greater Auckland area some differences immediately appear. A lot of species of course are simply not present on Rangitoto and a lot of species which are prolific elsewhere have hardly got going on the Island. Phenacohelix giveni thrives in very dry conditions on some lava fields at Mt. Wellington and P. erigone is common around Auckland in marginal situations. H. hectori is much more prominent on Rangitoto than elsewhere in Auckland and one supposes is filling up a gap left by these others.

It is surprising that the introduced snails and slugs have not become more prominent (and gratifying too), particularly Oxychilus cellarius . Richard Willan has pointed out that the little slug Arion intermedius seems to be absent from mainland Auckland.

Rangitoto is an ideal habitat for snails , still a bit dry, but improving all the time with increasing vegetation. It is a pity it did not acquire a few more native species before the sources disappeared.

ACKNOWLEDGEMENTS

I would like to thank Dr. M.P.Kerney of Imperial College , London for verifying the identification of Arion intermedius.
Dr. F.M.Climo for identifying Punctid n.sp. 5 & 38
Richard Willan in addition to supplying notes and comments also checked my draft copy.

A GATHERING ON THE AUPORI PENINSULA

by Margaret Morley

Twenty-two club members visited the far north during Easter 1986. The Pukenui Motel conveniently housed eight of us, including Ann Randall and Nancy Smith from Mount Maunganui. Several family groups stayed nearby in the camping ground. Kevin Burch and his family from Whangarei were in a unit at the Motel. We were also joined for trips and gatherings by Molly and Hunt Seelye.

On the drive north, Tauranga Bay made a pleasant break. Several Cuntharidus opalis were washed in and live specimens of Baccinulum pallidum powelli and Tugali elegans found at low tide. Cable Bay was examined in the fading light. Soon after my petrol gauge ominously reached the red empty mark. We were greatly relieved to find the Mangonui station still open.

Thursday evening friendships were renewed and PLANS made! Forces were split on the Friday morning, some collectors going to the west coast and some to Rarawa Beach. Here there were many Umbonium zelandicum washed in. At Paxton Point, Joan Willan found large Poirieria zelandica and Mesopeplum convexum. Most of the material at high tide level was damaged.

The low tide in the afternoon attracted all hands to Paua on the Parengarenga Harbour. After many muddy footsteps and much concentration the Zostera flats yielded the following species - Nassarius spiratus, Natica migratoria, Solemya parkinsoni, Polinices simiae, Philine angasi, Amalda australis, Bulla quoyii, and various Cominella.

In spite of strongly worded advice about the danger of big sharks, strong rips and muddy bottoms, I decided to make use of my wet suit and snorkelling gear. Shortly after entering the water I spotted two large Hydatena physis. My frenzied calls brought Rene Kindleysides to my assistance. To avoid damage to the thin lips we gingerly transferred them to her bucket. The spectacular animals were much larger than the shell with their peachy pink mantles waving and flowing in contrast to the luminous blue edge. Rather breathlessly I floundered back into the water. Soon afterwards the back of a Bullina lineata showed above the mud. This animal is also beautiful, the mantle being silvery blue with a white edge. We were interested to note it has an aperculum. My other finds that day included live Amalda novaezelandiae and Cominella quoyana.

Hydatina physis Linnaeus 1758

In the evening Betty and Bob Grange invited members to their bach. Here the pros and cons of different beaches were analysed, various schemes for the rest of the weekend were proposed, rejected and proposed again!

Saturday saw most people at the Bluff on Ninety Mile Beach. The incoming tide forced an early retreat off the island. One extra strong wave caught Judith Snook off guard and gave her an unscheduled swim. Shell finds were Tania zelandica, Phenatoma rosea and P. zelandica, Zeacolpus ahiparanus and white Dosinia anus. The weather remained fine. Rene even had an intentional swim. Paua beckoned again for the low tide.

Kevin Burch went diving and produced Bullina lineata and Maurea punctulata. I went snorkelling and spent some time admiring all the wealth of activity on the Zostera flats at half tide. The siphons of Chione stutchbunyi showed clearly, Cominella glandifornus were converging on a feast and the occasional Nassarius spiratus with its large foot ploughing purposefully through the mud. In deeper water, crabs scurried into holes as I approached. Here also were large congregations of Haminoea zelandica. Although the tide was turning when I came out I decided to search on foot. This required a lot of effort and resolve after two hours in the water! I was pleased to find a Ranella australasia and was on my way back when I saw a Conus lischkeanus kermadecenois just coming up out of the mud. The probosis and leading edge of the foot were scarlet. Even when I had picked it up I could hardly believe my luck and had to keep checking it again. While driving "home" to Pukenui we saw a white cattle egret.

Sunday was chosen as the day to walk from the Te Werahi gate to Cape Maria van Diemen. Following Hunt's advice we left at 7.30 a.m. (Kon Hepers was a late starter and finished his breakfast literally on the run!) The estuary at Te Werahi was safely crossed but the incoming tide soaked most people when negotiating various rocky points. Fortunately the sun soon dried us out. Rae Sneddon picked up what she first thought to be a land snail, it proved to be a fresh Recluzia rollandiana. We struggled up the steep sand slide to find fossil Placostylus ambagiosus priscus, P. ambagiosus worthyi, Rhytida duphcama. The small live colony of P. ambagiosus consobrinus was looked at.

The next exciting find of the day was a fossil Panyphantia busbyi watti, found by Doug Snook. The wash up on Cape Maria van Diemen was well picked over. The following species were found. Trivia merces, Gomphina maorum, Acar sandersonae, Venericardia reinga, Monodilepas diemenentis, Zegalerus terranovae, Sigapatella superstes and Dentalium sp.

Various routes were taken on the return according to degrees of energy and enthusiasm. It was certainly quicker going back down the sand slide than coming up! This time the tide was well out and we were able to examine low tide rocks and have a swim. In ideal evening conditions we drove to Cape Reinga lighthouse. The surf was being flung high into the air as the two oceans met.

We visited Hukatene on the west coast the next morning. There were many single valves of Panopea smithi with an occasional double. On the way back along the beach I focussed on a totally encrusted Nautilus macromphalus. It was well embedded in the sand and although the body whorl was badly damaged eventually cleaned up well to show its brown and white markings.

Paua lured us for a last time but was far less inviting with a cold south westerly wind sweeping rain across the flats. Undeterred, Ann, Nancy and Joan set out on foot, while I snorkelled close to shore.

Joan's effort was rewarded with a Septa exaratum. Her specimen had an exceptionly long siphon canal. This caused some speculation as to its identity. Septa parthenopeus were also found, but mostly with the hairy periostracum eroded.

As a climax to an exciting weekend we admired a vivid pink and orange sunset framing the white sand bar and reflecting on clouds out to sea.

EASTER WEEKEND 1986

by Doug Snook

The following is a list of species found.

BREAM BAY URETITI 28/3/86 (stopped for morning tea)

Dosinia anus
Dosinia subrosea
Struthiolaria papulosa
Longimactra elongata
Umbonium zelandicum
Paphies subtriangulata

TAIPA BEACH 28/3/86 (stopped for lunch)

Longimactra elongata
Venericardia purpurata
Dosinia anus
Bassina yatei
Maurea punctulata
Glycymeris modesta
Mytilus edulis ½ valve only-beach
Chlamys zelandiae ½ valves "

TOKERAU BEACH 28/3/86 (afternoon-North end)

Tawera spissa
Dosinia anus
Dosinia subrosea
Venerupis largillierti
Bassina yatei
Venericardia purpurata
Longimactra elongata
Cookia sulcata
Cantharidus opalus
Cantharidus purpureus
Struthiolaria papulosa
Cirsotrema zelebori
Gari stangeri
Umbonium zelandicum
Pupa kirki
Amalda australis
Corbula zelandica
Trochus tiaratus
Micrelenchus sp.
Marginella sp.
Red Worm Shell
Dentalium nanum
Duplicaria tristis
Pecten novaezelandiae ½ valve

BLUFF - NINETY MILE BEACH 29/3/86 (morning)

Spisula aequilateralis
Mactra murchisoni
Spirula spirula
Austrofusus glans - beach worn -
Tanea zelandica

PAUA - PARENGARENGA HARBOUR 29/3/86 (afternoon)

Amalda australis
Solemya parkinsoni
Natica migratoria
Zeacumantus lutulentus
Bulla vernicosa
Pecten novaezelandiae
Bulla quoyi
Haminoea zelandiae
Chione stutchburyi
Myadora striata
Cominella virgata brookesi
Cominella glandiformis
Thais orbita
Cominella maculosa
Cominella adspersa
Septa parthenopeus
Ranella australasiae
Struthiolaria papulosa (juvenile)
Maoricolpus roseus
Turbo smaragdus
Tawera spissa

CAPE MARIA VAN DIEMEN 30/3/86

Zegalerus terraenovae	)	
Spirula spirula	)	
Chione stutchburyi - beach -	)	Te Werahi Beach - wash up
Cellana radians	)	
Perna canaliculus	)	

Duplicaria flexicostata		Mesopeplum convexum	½ valve beach
Glycymeris modesta	½ valves only	Limatula maoria	½ valve
Amalda australis		Modiolus areolatus	
Vernicardia reinga		Emarginula striatula	
Gomphina maorum		Cardita aoteana	½ valves beach
Monodilepas diemenensis		Gari stangeri	½ valves
Tawera spissa	½ valves beach	Paryphanta busbyi watti	- sub fossil
Chlamys zelandiae	½ valves	Placostylus ambagiosus	- sub fossil

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DIVING AND DREDGING AT THE ENTRANCE TO TRYPHENA HARBOUR

by Ian Scott

One of the best places to look for shells is on offshore reefs; and when these reefs are also on offshore islands, then the pickings are even better. At Easter a group of us visited Amodeo Reef at the entrance to Tryphena Harbour, Great Barrier Island, and also dredged for shells in the water around it.

The reef itself rises from the sea floor from a depth of 25m to within 5m of the surface. It is several hundred metres from the nearest coast and is surrounded by water at least 30m deep. The dominant algae on the reef is Ecklonia radiata which grows thickly closer to the surface, but at depths is more spread out, allowing room for a diver to easily swim between its stalks. The rocks themselves are coated with coralline algae and sponges, and numerous fish were present. Numerous cracks and overhangs with the occasional cave and arch provide the hiding places for the abundant molluscan life.

The dominant large herbivore was not Cookia sulcata as it is in shallower water on the adjacent coast, but rather Turbo granosus which outnumbered C. sulcata by about twenty to one. They were abundant around 20m and had most beautiful pink markings in the umbilical area. Another herbivore, Cantharidus purpureus, which is abundant in shallow water in the harbour, was quite uncommon at Amodeo reef.

Perhaps the best specimen shells we found were Muricidae. The best of these were several large specimens of Pterotyphis eos of which each of us found at least one. These were a far cry from the worn beach specimens that most of us have to be contented with as their delicate varices were still intact. Dave Gibbs won the prize for the best specimen! On the rocks themselves the most common Murex was Muricopsis espinosus mariae which were often found in small clusters out in the open. Where the rocks gave way to sand the most common Murex became Muricopsis octagonus with again specimens crawling on the sand or on rocks very close to sand. Two specimens I found were feeding on a specimen of Venericardia purpurata having drilled tiny 0.5 to 0.8 mm holes through the shell to get at the animal inside. Later when we dredged the sediments surrounding the reef at 20 - 30 metres, we found many more M. octagonus, many of which had beautiful recurved spines. A few specimens of Thais orbita were seen, but these were not common as they are in shallower coastal waters.

The Buccinulums were also interesting. Perhaps the most unusual feature was the high percentage of orange coloured forms. With Buccinulum vittatum 40 - 50% of specimens seen were orange in colour; whereas with Buccinulum lineum approximately 10 - 20% were orange. I personally have never seen orange coloured forms of either of these two species on the mainland. Another shell, Buccinulum pallidum powelli was very common on some parts of the reef to the extent of being the dominant Buccinulum. On the east coast north of Auckland you are lucky to find one specimen of this in a year as it is quite uncommon. Another interesting feature was the tendency for axial ridges to appear on Buccinulum lineum. This feature was quite pronounced, and again I have not personally recorded this on mainland specimens. Other Buccinulums seen were B. robustum and B. mariae.

Only two Cominellas were noted. The most common of these was Cominella quoyana which was sometimes found in colonies of five or more shells. These were much paler then the specimens found in shallow water further into the harbour. The other Cominella found which was perhaps rather surprising was C. adspersa. We are used to finding this species on mud or sand flats at low tide, but several specimens were noted on the reef at a depth of 20m.

Of the Ranellidae a single dead specimen of Septa exaratum exaratum was found and this was a beautiful reddish brown colour. Ranella australasia (the common "Mayena") was common and all were of the vossi form. Cabestana spengleri were seen on the reef but more frequently dredged from the surrounding area. A single specimen of Charonia lampas was collected near the top of the reef.

Four species of Maurea were collected, and many of these were either found in or near to black Ancorina alata sponge. Specimens of Maurea punctulata, M. tigris and M. osbornei were common at depths of 20 - 25 metres and at this depth the ratio of M. punctulata to M. osbornei was about 1:1. The M. osbornei in particular were usually buried in the sponge having eaten a cavity there first. Two specimens of M. pellucida were also collected on the reef.

Of other species found, one of the highlights was a single specimen of Xenophora neozelanica found by Steve O'Shea on the sand flats about 30m out from the reef. Paraclanculus peccatus were found underneath rocks resting on sand close to the reef at 25m. Quite a few specimens of Waimatea obscura were found, and several of these were actually out crawling on sand and not in rock crevices where they are usually found. All specimens collected were of the axially ridged mortensi form.

Several large Astraea heliotropium were found on the reef as well as several juveniles about 50cm in diameter that had long recurved spines unlike any others I have seen. Several live Penion dilatatus were found on the reef, and on the sand flats around it were dredged several dead Penion cuvieranus. Emarginula stratula were numerous in dredgings, particularly on dead Glycymeris and Pecten valves. Other gastropods noted were: Trochus viridis, trochus tiaratus, Maoricolpus roseus, Sigapatella novaezelandiae, Maoricrypta costata, Maoricrypta monoxyla, Marginella pygmaea, Taron dubius, Xymene traversi, and numerous small shells such as Bittium exile, Austromitra rubiginosa, Austrodrillia sp., Macrozafra sp., Neoguraleus sp., Zemitrella sp., and Triphora sp.

Most bivalves collected were done so by dredging. Best results were had on the Pecten novaezelandiae and Glycymeris laticostata beds at the harbour entrance. Inside dead specimens of these were found numerous Chlamys which were using the inside of these shells for protection or camouflage. There were about equal numbers of Chlamys gemmulata and C. zelandiae in a wide spectrum of colours and patterns as well as occasional small specimens of C. zeelandona. Another common bivalve was Barbatia novaezelandiae which were particularly common around the entrance to octopus lairs! A few Mesopeplum convexum were dredged. Other bivalves noted were Modiolus areolatus, Limaria orientalis, Dosina zelandica, Dosinia maoriana, Atrina zelandica, Corbula zelandica, Cardita aoteana, Cardita brookesi, Cleidothaerus albidus and dead specimens of Gari stangeri, Longimactra elongata, Glycymeris modesta and Tawera spissa.

MORE ON ALBINO SHELLS ....

In response to my request for information about albino shells, Bob Penniket has sent the following list of albino specimens in his collection:-

Alcithoe arabica - Great Exhibition Bay, July, 1979

Ranella australasia - Matepouri, 1966

Septa exaratum - Tutukaka, May 1984

Haustrum haustorium - Te Tii, Bay of Islands

Maoricolpus roseus - dredged at 180m off Taiaroa Head, Otago

Lima colorata zealandica - dredged at 300m East of Stewart Island

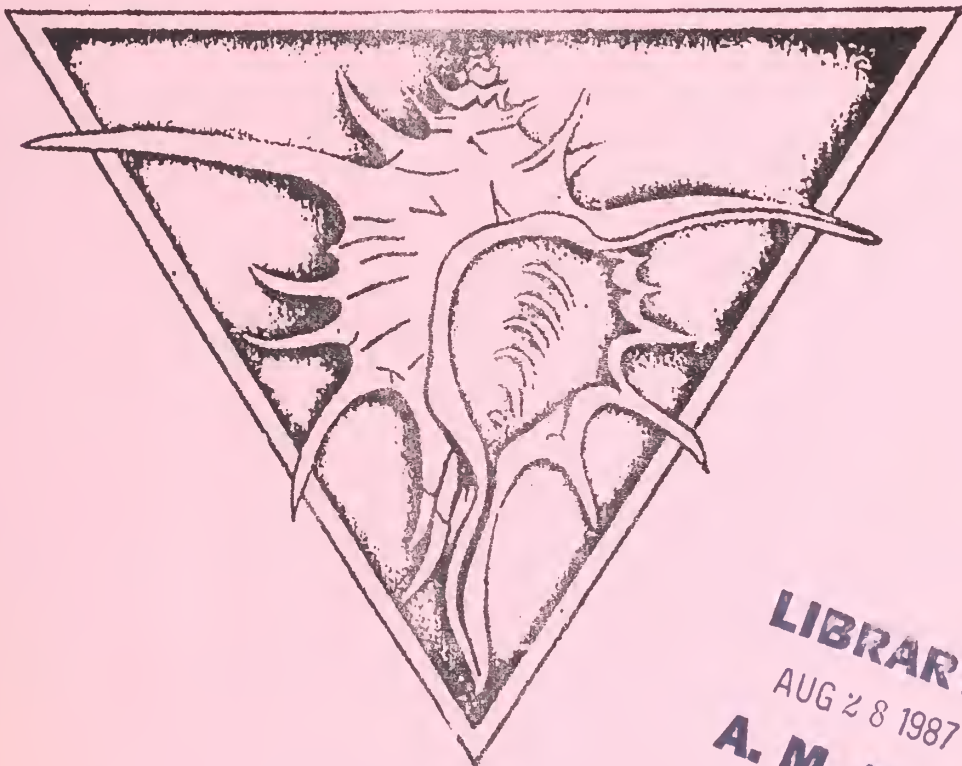
Penion dilatata - Opahi Bay, Mahurangi West, September, 1982

Maurea punctulata - Snares Is, November 1983

All of the above were live collected specimens. With beached shells some species may fade to white in only a week or so and hence appear to be albinos when in fact they are not. Bob also reminded us of the fact that deeper water specimens tend to be paler in colour than shallow water specimens. A well known example of this is the pale white form of Charonia lampas capax found in deep water compared with the colourful shallow water form.

I would still like to hear from other collectors who could add to this list.

POIRIERIA



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C O N T E N T S

EDITORIAL

Recently Dr Tucker Abbott made a statement that he considered that only 20-25% of proposed species names were valid. In making this statement he was not only referring to the many mistkes made by workers last century with limited access to each other's work; but was also referring to recent authors. Thus when Dell sorted out The N.Z. *Calliostoma* (*Maurea*) in 1950 this 20-25% of validity probably applies to him, and we look forward to a review or update of this group in the near future. Perhaps the area where most of us come across this is in the proliferation of names proposed for new *Conus* species. Do we go all out trying to collect all these supposed new species or do we smugly sit back and wait for them to be synonymized at some future date?

Finally, a plea for more articles from our readers. If you can't manage a full-sized article then how about an "Items of interest" sized article?

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UNCONFIRMED SIGHTING OF

Babakina caprinsulensis

by Margaret Morley

While collecting at Matheson's Bay, Leigh on November 2nd 1986, I noticed a small nudibranch under a stone in a low tide rock pool. Conditions were calm with a 0.2 m. tide. When found, the specimen's head was curled up to the tail resembling an anemone. It was not laying spawn nor on a possible food source. The stone it was under was covered in pink *Corallina* paint. Other organisms in association were *Serpula* sp. (tubeworms) *Rissellopsis varia* and *Borniola reniformis*. The extended length was 10 - 12 m.m. For its size it crawled rapidly around the lid of a container.

Body colour was pale mauve, a distinctive irridescent white area on the head. Cerata were white in 5-6 oblique rows. The yellowish green tips described in Dr Miller's paper were not noted but could easily have been present. Bear in mind the specimen was only 12 m.m. long, I did not have a lens nor did I realise what a rarity I was viewing! The oral tentacles were a transparent white with the distal third bright yellow. The rhinophores' colour of tan brown matched that of the type specimen but I remember those on my specimen as slender rather than bulbous. The white line on the tail was present but the tail differed by being moderately long and very thin towards the tip.

On arrival at home I looked up this find and was chagrined to realise its probable identity. I have a strong mental image of its joyous descent back into the pool and continued obscurity! *Babakina caprinsulensis* (Miller 1974) is only known by the type specimen found by A.M. Ayling in 1965 at Goat Island Beach in a similar habitat.

In an attempt to rectify my mistake I returned at the next suitable tide on December 5th. For two and a half hours I hopefully turned all moveable stones in the same area. My effort was, not surprisingly, in vain.

Will another twenty-one years pass before the next sighting?

References:

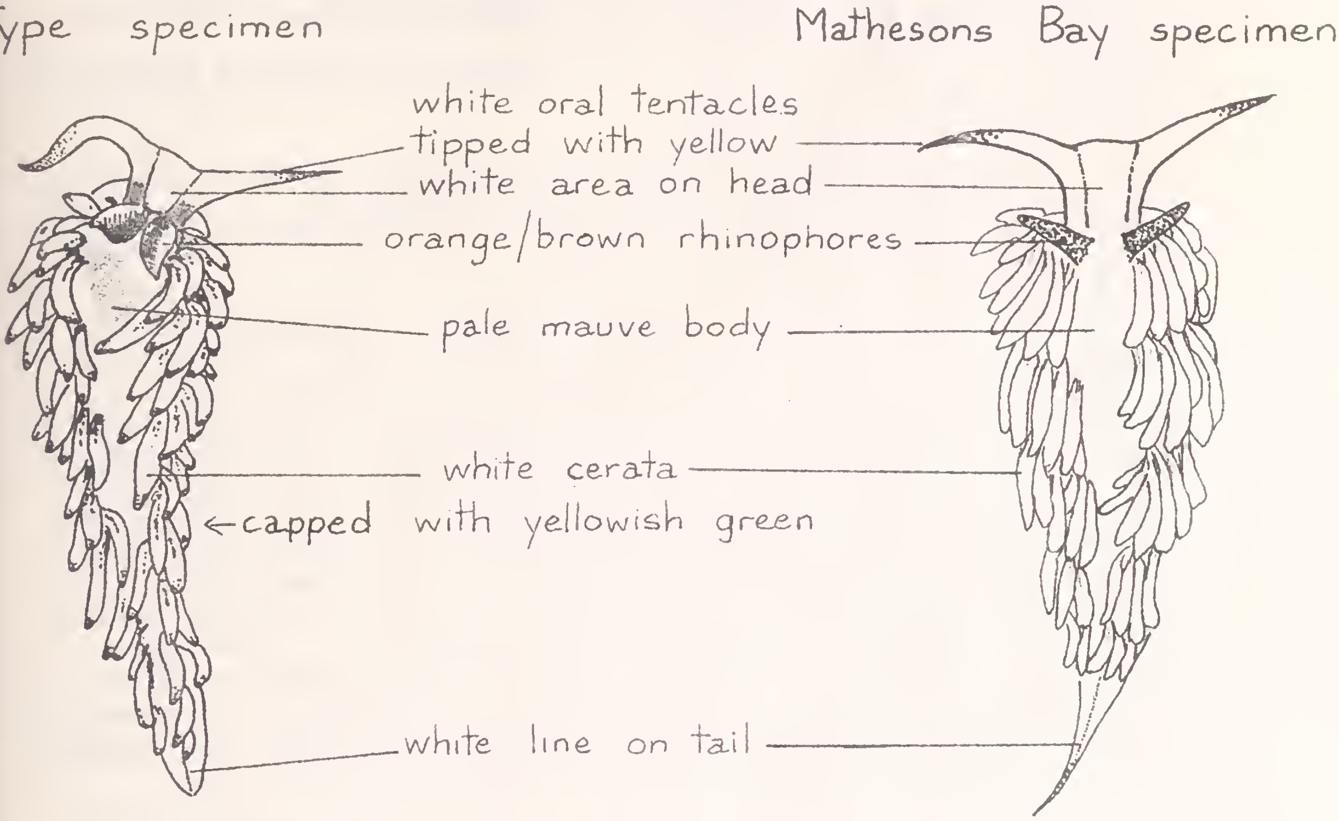
1. New Zealand Mollusca
   A.W. Powell   P.290

2. Marine Molluscs
   Part 2 Opisthobranchia
   Richard Willan and John Morton   P.75

Acknowledgements

Thanks to Dr M.C. Miller for his information, copy of his original paper and use of the diagram of the type specimen.

Babakina caprinsulensis (Miller 1974)



SHELL NAME CONFUSION

by Ian Scott

Speaking of shell names, are your hairy tritons called parthenopeus, parthenopeum or parthenopea? Those with a knowledge of Latin will chuckle and appreciate that the difference is merely one of gender - whether the word is masculine, neuter or feminine. In fact which of these we use is determined by the gender of the genus that goes before this. Thus modern, up-to-date collectors will call the shell septa parthenopea with its matching "-a" feminine endings; whereas slightly out-of-date collectors will stick with Powell's book and call it Monoplex parthenopeus with its matching masculine genders; or the "lumpers" amongst us (or those that can't make up their minds) will refer to it as Cymatium parthenopeum with its matching "-um" neuter endings. In the majority of cases species names match the gender of their genus very closely as illustrated in the following examples:

Cardita aoteana (feminine) versus Nassarius aoteanus (masculine)

Marginella amoena (feminine) versus Neoguraleus amoenus (masculine)

Poirieria zelandica (feminine) versus Serpulorbis zelandicus (masculine) and Umbonium zelandicum (neuter).

However, there are other rules that come into play when shell species are named after people. For example, shells named after Mr Powell will all adopt the masculine genitive ending "-i" regardless of whether the genus is masculine or feminine or neuter.

e.g. Buccinulum powelli, Nepotilla powelli, Cyclopecten powelli

Similar examples can be found if you look up all the shells named "suteri" after Mr Suter or "huttoni" after Mr Hutton. If the species is named after a woman, then the feminine ending "-ae" is used instead, again regardless of the gender of the genus. Due to a shortage of female malacologists, N.Z. examples are hard to find; but a couple of overseas examples are Cypraea alisonae named after Dr Alison Kay and Cypraea cohenae named after Mrs Iris Cohen. A N.Z. example with this ending is Tellina charlottae; but in this case, rather than the shell being named after some malacologist's girlfriend, it is named after Queen Charlotte Sound, the type locality. If both husband and wife worked together to discover or identify a new species and it is named after both of them, then the plural ending "-orum" is used. An example of this is Cypraea schilderorum named after Mr and Mrs Schilder.

Another lot of exceptions to the rule are those names based on place names or ethnic names. Place names tend to ignore the gender of the genus and adopt the genitive "-is" ending meaning "of such and such a place". Two examples from the Manukau Harbour are:

Neoguraleus manukauensis and Odostomia manukauensis. Other familiar examples can be found by looking up species "australis", "chathamensis", "macquariensis" and "haurakiensis". However, after stating this, such place names may change when used instead as an adjective describing the genus:

e.g. Xenophora neozelanica, Scrinium neozelanicum, Modiolus neozelanicus

In a similar fashion ethnic names, such as those based on Maori words, also tend to ignore the gender of the genus:

e.g. Xenophalium matai and Perrierina matai

Confused by all this still? Well try enrolling in a Latin night school class! However, a point worth remembering is that many authors of popular shell books have little understanding of the above rules and so mistakes abound. Therefore don't take your shell books as the "gospel truth" on shell names.

QUEENSLAND TRIPS 1985 and 1986

In July/August 1985 a group of six conchology members -
- Rene Kindleysides, Peggy and Stan Town,
- Jenny and Laurie Ford from Christchurch and myself, travelled the

Queensland coast from Port Douglas to Townsville. From Port Douglas we went on a shelling trip to the Inner Rudder Reef (see Poirieria Vol.15 No.1 - "An Experience on the Great Barrier Reef"). From Cairns we sortied to northern beaches varying from sand, to mud, to rocky points. We "invested" in several shell shops and visited the Sea Aquarium, Hartley's Wildlife Reserve, and went by paddle boat up the Everglades. One all day trip took us in the Kuranda Railway (an experience in itself) up to the Tablelands and a bus trip through rain forest to Atherton for lunch and a visit to Tinaroo Orchid Gardens. On then to Lake Barrine and a cruise in a flat bottomed boat to look at many different birds.

After eight days in Cairns we loaded our hired car and headed south. We took five days on the trip to Townsville staying at caravan parks and motel units on the way. We checked the beaches - Brampton Beach, Kurramine, Flying Fish Point, Cowley Beach, Mission Beach, Tully's Heads. At Cardwell we stayed two nights in the Kookaburra Caravan Park, and from there went by fast launch out to Hinchinbrook Island for the day, and there found fossil crabs and pipis. From Cardwell we drove to Lucinda and had very good shelling on sandflats. We finally arrived in Townsville and booked in to Bundock Court Motel with a car load of increasingly smelly shells.

Six days in Townsville were filled quickly with shelling, shopping, visits to AIMS (Australian Institute of Marine Science), and Magnetic Island , - and more shelling. And of course, the Townsville Shell Show. We were contacted early by Maureen Hagerty, an ex-Kiwi, and then taken by van to the Show's social evening, where we were introduced to the "one cent sale", an Aussie institution. Next day we had a good look at the Show and spent - recklessly - at the Trading Tables. Members of the

Townsville Shell Club called to see us on our last day and presented us with even more shells. We flew back home overloaded with goodies and the friendly warmth of our reception.

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August 16, 1986 found three of us, Peggy and Stan Town and myself, meeting in Townsville and staying at the same motel. The Townsville Shell Show was on again and we went in anticipation, meeting old friends, playing the "one cent sale", and patronizing the Trading Tables. This time Hunt and Molly Seelye were there and they and the Towns entered displays. Peter and Bev Swan of the Shell Club took us under their wing and shuttled us backwards and forwards in their van.

Sunday night we joined other Shell Club members - eleven of us altogether - and boarded "Divemaster", a 60-70 ft. launch. At about 3 a.m. we headed out of Townsville to Little Trunk Reef, six hours away. There we stayed for two days, fishing at high tide and shelling as soon as the Reef was far enough out of the water. The sea stayed calm and the sun shone and everyone got goodies. On the way back to Townsville we watched the Air Force practicing night bombing, got "buzzed" when we ventured too close, and had fire engines rushing to pump us out when we got to the wharf!

The rest of our week there was spent in cleaning shells, shopping, shelling on the local beaches and visiting Shell Club members. Our thanks go to them for their hospitality, and in particular to Bev and Peter Swan for taking us into their family and making sure we got to the right place at the right time.

In all there were 388 named species alive and dead.
Highlights from the combined finds from both trips were:

Haliotidae
Haliotis varia
Haliotis asinina

Trochidae
Trochus niloticus
Trochus maculatus
Trochus fenestratus
Trochus virgatus
Trochus lineatus
Tectus pyramus
Monodonta labio
Chrysostoma paradoxum
Angaria delphinus

Turbinidae
Turbo setosus
Turbo chrysostoma
Turbo militaris
Turbo cinereus
Turbo argyrostomus
Turbo bruneus
Liotina peronii
Astraea calcar

Neritidae
11 species

Architectonicidae
Architectonica maxima
Architectonica perspectiva
Architectonica acutissima
Architectonica reevei
Heliacus stramineus
Heliacus variegatus

Potamididae
Telescopium telescopium
Terebralia palustris
Terebralia sulcata
Cerithidea obtusa
Cerithidea anticipata

Cerithiidae
Cerithium fasciatum
Cerithium echinatum
Cerithium sinensis
Cerithium dorsuosum
Cerithium nodulosum
Cerithium aluco
Cerithium novaehollandiae
Cerithium articulata
Cerithium alveolus
Rhinoclavis asper
Clypeomorus zonatus

Epitoniidae
Epitonium acuminata
Epitonium perplexum

Strombidae
Lambis lambis
Lambis truncata sebae
Lambis chiragra
Strombus luhuanus
Strombus microurseus
Strombus canarium
Strombus labiatus
Strombus vitellus campbelli
Strombus gibberulus gibbosu
Strombus erythrinus
Strombus mutabilis
Strombus aratrum
Strombus dilatatus
Strombus urceus orrae
Strómbus lentiginosus

Ovulidae
Phenacovolva angasi
Primovula bimaculata
Primovula cavanaghi
Primovula pyriformis
Calpurnus verrucosis

Cypraeidae
Cypraea eglantina
vitellus
carneola
isabella
asellus
caurica
errones
annulus
moneta
erosa
caputserpentis
gracilis
subviridis
ursellus
pyriformis
arabica
lynx
nucleus
miliaris
walkeri
tigris
pallidula
kieneri
cribraria

Naticidae
15 species

Cassidae
Phalium areola
Phalium bandatum
Casmaria ponderosa
Casmaria erinacea

Cymatiidae
Cymatium thersites
Gyrineum gyrinum

Bursidae
Bursa granularis
Bursa rana

Muricidae
Chicoreus brunneus
Chicoreus axicornis
Chicoreus cornucervi
Thais kieneri
Thais luteostoma
Thais bufo
Thais hippocastanum
Murex macgillivrayi
Morula margariticola
fiscella
marginatra
marginalba
aurantiaca
funiculus
anaxeres
foliacea
Nassa serta
Coralliophila costularis
Drupa grossularia
Bedeva hanleyi
Rapa rapa
Pterynotus bipinnatus

Buccinidae
Cantharus fumosus
Cantharus undosus
Cantharus erythrostoma
Appisania fasciculata
Engina lineata
Engina alveolata
Phos textum
Phos senticosus

Fasciolariidae
Latirus polygonus
Latirus blosvillei
Latirus smaragdula
Pleuroplaca filamentosa
Peristernia nassatula
Fusinus colus
Fusinus australis
Fusus pricei

Nassariidae
13 species

Olividae
Oliva oliva
vidua
elegans
miniacea
lignaria
caldania
caerulea
annulata

Mitridae
Mitra variabilis
mitra
semifasciatum
nebularia fraga
cucumerina
ferruginea
imperialis
pyramis
retusa
Vexillum cavea
zelotypum
amanda
radix
taeniatum
rugosum
Cancilla strangei
Neocancilla circula
Pterygia crenulata

Turbinellidae
Vasum turbinellus
Tudicula armigera
Vasum ceramicum

- - - - Volutidae
see page 9.

Conidae
Conus emaciatus
litteratus
marmoreus
suturatus
eburneus
generalis
miles
sponsalis
quercinus
capitaneus
coronatus
miliaris
vexillum
textile
virgo
flavidus
muriculatus
magus
arenatus
parvulus
rattus
vitulinus
frigidus

Conidae (cont.)
Conus varius
lividus
cumingii
distans
chaldeus
imperialis
glans

Terebridae
Terebra chlorata
crenulata
fenestrata
strigilata
babylonia

Bullidae
6 species

BIVALVES

Arcidae
Anadara trapezia
granosa
nodifera
scapha
antiquata
Trisidosus tortuosa
Trisidos semitorta
Arca subnavicularis
Arca ventricosa
Barbatia amygdalumtostum
Barbatia velata

Malleidae
Malleus malleus
Malleus albus
Vulsella vulsella

Pectinidae
Chlamys pallidum
Chlamys leopardus
Chlamys squamosa
Decatopecten plica

Cardiidae
Trachycardium orbita
Fragum fragum
Acrosterigma flava
reeveanum
dianthinum
Plagiocardium setosum

Mactridae
Mactra antiquata
dissimilis
obesa

Solenidae
Solen strictus
Solen roseomaculatus
Ensiculus hilaris

Tellinidae
Tellina remies
capsoides
inflata
albinella
rostrata
staurella

Psammobiidae
Gari tripartita
maculosa
truncata
Asaphis violascens

Veneridae
Gafrarium pectinatum
tumidum
dispars
divaricatum
Placamen tiara
Ruditapes variegatus
Tapes dorsatus
phillipinarium
belcheri
Marcia japonica
Pitar citrinus
Paphia crassisulea
gallus
Circe rivularis
Lioconcha castrensis
Periglypta puerpera
chemnitzi
Gomphina fulgida
Costacallista lilacina
Venus embrithes
Antigona lamellaris

BRACHIOPODA

Lingula jaspidea

Volutidae (page 8.)
Cymbiola rutila
Amoria maculata
Amoria grayi
Melo amphora (juv.)

Rae Sneddon

EVEN WELL KNOWN SPECIES NEED NAME CHANGES

by P.R. Jamieson

Two recent papers spell further name changes for some well known New Zealand mollusca.

1. Pleistocene Chlamys patagonica delicatula (Bivalvia: Pectinidae) off southern Tasmania, and history of its species group in the Southern Ocean. A.G. Beu. 1985. Spec. Publ. S.Aust. Dept. Mines and Energy, 5:1-11

The author considers our Chlamys delicatula to represent a subspecies of the southern South American chlamys patagonica. Hence New Zealand shells should now be called Chlamys patagonica delicatula (Hutton, 1873). This step is reached from evidence of the closely similar shell features and allometric changes during growth, and also the likelihood of larval interchange between populations. A fossil population from Tasmania, known as Chlamys instar Iredale is also shown to be synonymous with Chlamys patagonica delicatula.

Beu also states that the subgenus Zygochlamys is totally inappropriate for this species group. The type of Zygochlamys is Pecten geminatus, an Argentine fossil not closely related to the patagonica species group at all. Due to the vast amount of work required on Chlamys taxonomy, no formal decision on the subgeneric rank of this species group is reached, although Beu suggests that Mimachlamys is probably most suitable.

For further details of this species history of dispersal, fossil ancestry and taxonomy, this interesting paper should be consulted.

2. Subgeneric classification of New Zealand and Australian species of Paphies Lesson, 1830 (Bivalvia: Mesodesmatidne), and names for the two species of tuatua in New Zealand. A.G. Beu and L.A. de Rooij-Schuiling. N.Z. Journal of Zoology, 1982, Vol. 9: 211-230.

In 1972 when Climo reinstated Mactra murchisoni Deshayes, it came as quite a surprise that 2 species were being confused under Mactra discors Gray. It may come as even more a surprise to some that there are in fact two species of tuatua in New Zealand. Although this conclusion was already reached by Richardson et al (1982), this paper sets out to determine the valid names to be used both at a species and subgeneric level.

The two species of tuatua are

(1) Paphies subtriangulata (Wood, 1828)

(2) Paphies donacina (Spengler, 1793) (Not to be confused with Paphies donacia (Lamarck), a South American species.) This species has previously been known as quoyi and forsteriana.

The former is a predominantly northern species, and the latter a predominantly southern species, with an overlapping distribution in central New Zealand. (See map.)

The subgenus to be used for all the New Zealand members of Paphies is Paphies (Paphies). The subgeneric name Mesodesma is restricted to South American species. Hence the following:-

Paphies (Paphies) australis

Paphies (Paphies) donacina

Paphies (Paphies) porrecta ?

Paphies (Paphies) subtriangulata

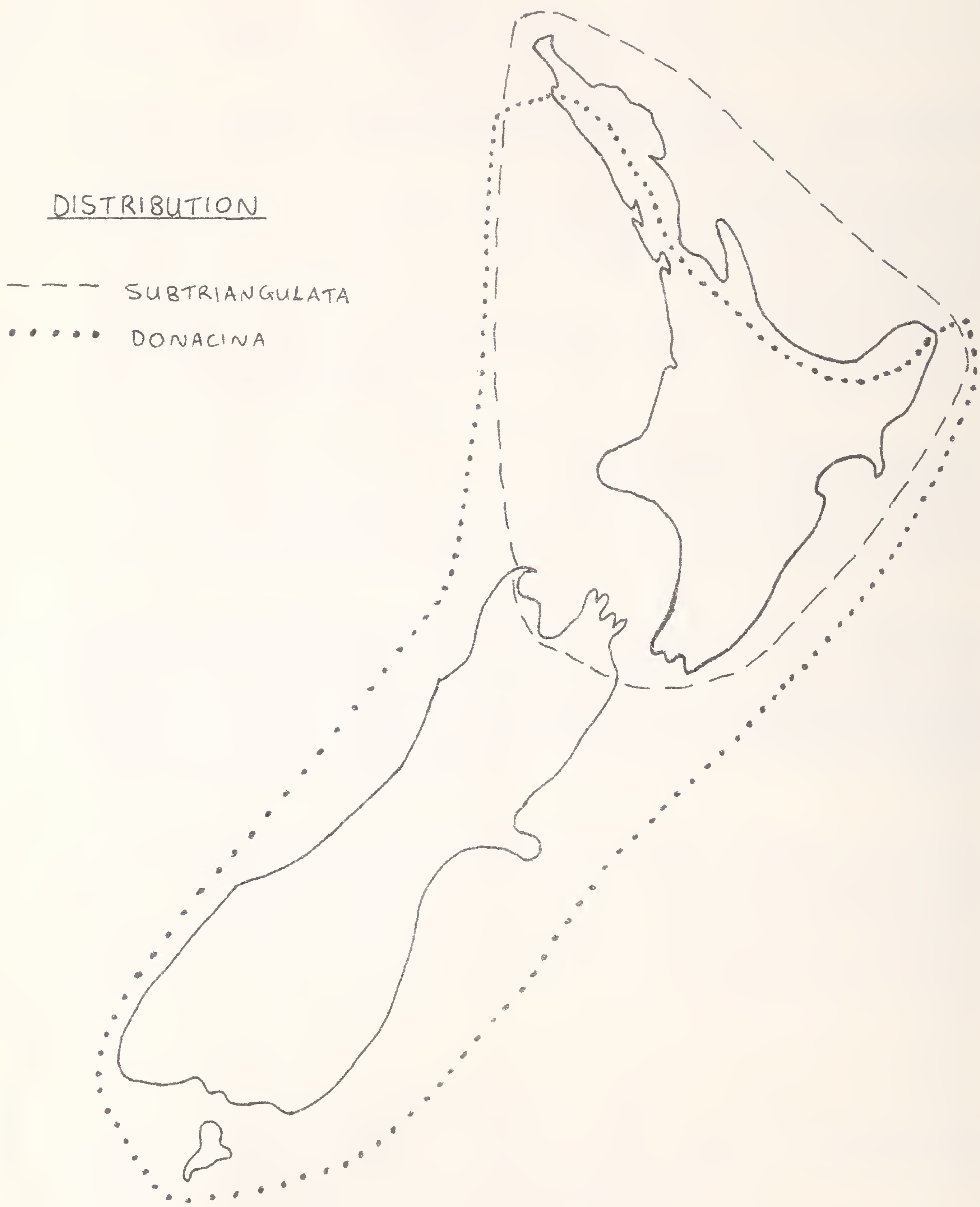
Paphies (Paphies) ventricosa

It was perhaps unfortunate that no definite conclusion as to the validity of Paphies porrecta was reached in this paper.

The shells of Paphies donacina can be distinguished from those of subtriangulata by

1. their longer smoother posterior area at a lower angle to the rest of the shell and blending imperceptibly into it
2. by the straight to weakly, or in most specimens, quite strongly convex outline of the posterior end
3. by their thinner hinge
4. by the resilium projecting further below the hinge line
5. by their more shallowly impressed adductor scars
6. by the more rounded pallial sinus

There are also differences in anatomy. If you have trouble distinguishing these two closely-related species, I suggest you try and obtain specimens from within the non-overlapping range of each species to help sort them out more clearly, before trying to work out which one you have from their overlapping distribution!


DISTRIBUTION
SUBTRIANGULATA
DONACINA

YOU KNOW YOU'RE A NEUROTIC COLLECTOR WHEN . . .

(Anonymous)

1. You spend two hours cleaning a shell, then throw it away after discovering a pinhole in the spire.
2. You get upset because Pseudaneitea schauinslandi or Tectisumen clypidellaeformis are misspelled.
3. Your "Want list" consists of 100 species, 99 of which are only known from one specimen.
4. You start checking INSIDE the lip for defects.
5. You swap "all you've got" to get a new specimen of a particular species because it's one millimetre larger than the one you already have.
6. You baby oil your fossils.
7. You are devastated when someone points out a minute flaw in a shell you were convinced was gem.
8. You do your best to get a colour series of Alcithoe larochei and a growth series of Marginella vidae.
9. You memorise Powell's checklist, including the errors.
10. You prefer the term "fastidious" to "neurotic".

(Adapted for New Zealand from the Concologists of America Bulletin, Vol. 13. No. 1, March 1985)

ITEMS OF INTEREST

- Several readers have responded with more examples of albino shells. Ailsa Cornelius of Dunedin points out the existence of a colony of creamy white Tanea zelandica living at Aramoana, Otago Harbour. These have none of the usual brown markings.

  Patricia Langford has the following albino shells in her collection: Struthiolaria vermis (from Te Arai Point), Maoricolpus roseus (Manly Beach, Whangaparaoa), Zeacolpus pagoda (Manly Beach, Whangaparaoa), Penion dilatatus (deep water off North Cape) and Pecten novaezelandiae (from Te Arai Point).

- Another reader mentions that while her son was diving for scallops at the Aldermans at 30-40 m. he found juvenile Septa parthenopea living inside them. The scallops were still alive, but very withered. The Septa in some cases were up to 38 mm in size.

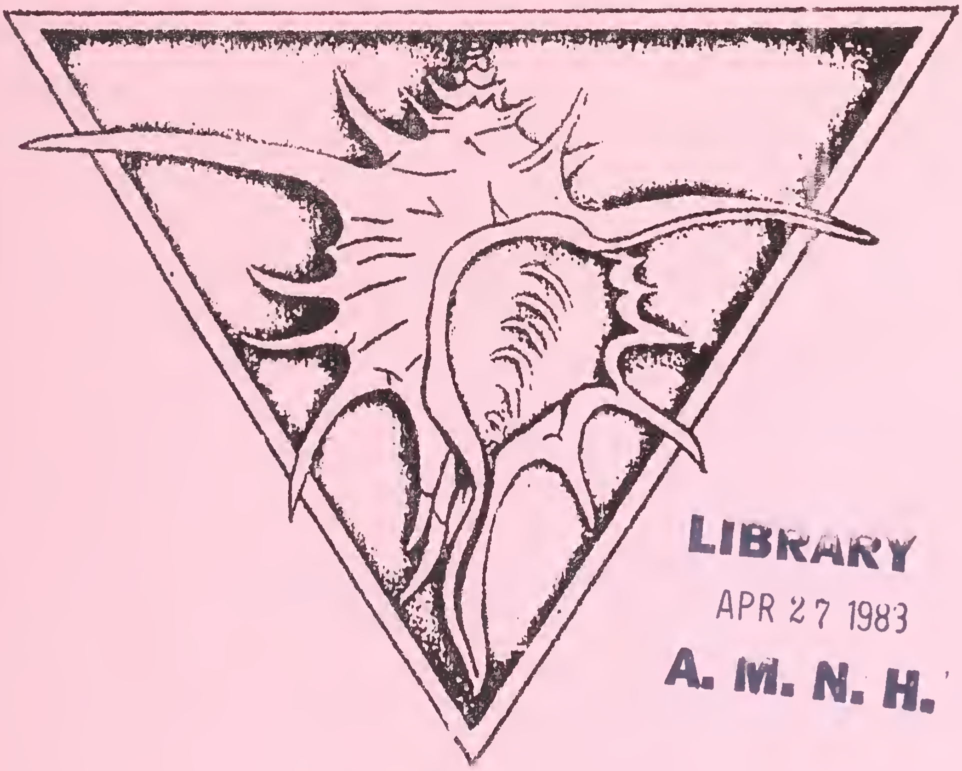
- Dr Bruce Marshall has kindly pointed out two mistakes in naming shells that we are frequently guilty of. He refers to the persistent uses of the genera Chione and Maoricrypta for N.Z. species. As long ago as 1979 Jones showed that Chione is not applicable to N.Z. species, which now belong in the genus Austrovenus. Our Maoricrypta species were referred to Crepidula by Hoagland in 1977.

- Last Spring I collected specimens of Septa parthenopea from two different localities and was intrigued by the differences between them. The first lot were collected crawling on the Zostera flats at Parengarenga Harbour and ranged from 68 to 85 mm in size. Their thick periostracum was as usual fringed with hair-like processes on average 3 to 5 mm in length. The second lot were found attached to the sides of large boulders resting in silty mud at Laingholm in the Manukau Harbour. These shells were all considerably larger, ranging from 95 to 115 mm in length and were much bigger, squatter shells. Their periostracum was considerably more hairy with the processes averaging 9 to 11 mm in length. It is easy to jump to conclusions to explain these differences, and I would be interested to hear the views of other Club members. One theory is that the species grows larger in colder water (with longer hairs to keep it warm!!) Certainly specimens I collected in the warm waters of Western Samoa were all considerably smaller than N.Z. specimens.

- Last August I went for a scuba night dive off Rakino Island in the Hauraki Gulf and found Amalda mucronata crawling on the surface of soft muddy ooze at a depth of 20 m. The shell was almost completely hidden by the animal to the extent that it looked more like a nudibranch than a shell. All specimens were completely out of the substratum when found, and left prominent trails for a distance of several metres. The only other live molluscs found in the same area were Struthiolaria vermis (which were also out crawling on the surface and not buried as they usually are in day-time) and Pecten novaezelandiae. The animal of A. mucronata was whiter than the one illustrated in Powell's "New Zealand Mollusca" and there was variation in the density of the brown flecks amongst different specimens.

  The underside or crawling surface was white with no brown flecks. Even after several hours in captivity the animals showed little inclination to retreat into their shells, and I suspect that in spite of the presence of an operculum, the animal would have difficulty in doing so. The size of speimens collected ranged from 28 to 36 mm.

POIRIERIA



Auckland Museum
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CONTENTS

EDITORIAL

It is with regret that we note the passing away of Dr A.W.B. Powell. His contribution to the study of N.Z. Mollusca was outstanding, and a quick glance through the pages of his "N.Z. Mollusca" will show how many species and subspecies he has identified and named. The present Conchology Section of The Auckland Institute and Museum grew out of a group of school boys with a common interest in shells who started a club in October, 1930 under the guiding hand of Dr Powell. This club then grew into what it is today, and in the process Dr Powell shared both his knowledge and his enthusiasm for shell collecting with many members. Dr Powell was a self-taught amateur with no formal qualifications. He joined the Museum staff in 1928 and was later to become an Assistant Director of the Museum. In his lifetime he was awarded many honours including an Honorary Doctor of Science from the University of New Zealand, a Fellowship of The Royal Society of New Zealand, and The Hector Medal. While later researchers may quibble about the validity of some of his described species, there is no doubting the dedication with which he tried to sort out some of our problematic shell families. Often he had to attempt this with few specimens to work from, and it is a credit to him that he was able to do it so successfully. He will be sorely missed by many and his efforts in conchology a hard act to follow.

Overseas subscribers to Poirieria may need some clarification as to how many issues to expect. Basically Poirieria is published when enough material comes to hand to put out an issue. While the aim is to publish twice a year, this is not always possible as it depends on the willingness of members to write articles.

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THE SANDBAR AT DINGO BEACH

by Nancy Smith

In August 1982, almost by accident, I spent a few days at Dingo Beach at the time of the spring tides, not knowing when I went there that this is the on-shore Mecca of Australian shell collectors. I was surprised and delighted at the number of species to be had, particularly from the sandbar. Also delightful was the friendly and helpful attitude of the many collectors who were camped there for the winter season, daily combing the bar and reef. So it was a real pleasure in August, '87 to have the chance to return and meet old friends again, and a real surprise to find that the sandbar still gives up a big crop of shells after all these years of intensive collecting.

About 200 metres off-shore lies Pelican Island and the sandbar has formed where the incoming tide, sweeping round both ends of the island meets in the middle. It is only fully uncovered on a spring low tide, when it makes a dry-footed path to within about 20 metres of the island, leaving a knee-deep channel to be waded if you wish to collect there. On either side of the bar muddy sand is uncovered, with patches of eel-grass, small sand islands and the odd small rocky area where you will see the beautiful little blue ringed octopus lurking, and find the handsome Nassarius glans with its vivid red operculum. There are lots of Nassarius; in the sandbar are N.splendidulus and albescens, on the sides N coronatus, elana pullus, luridus and, if you are lucky, whiteheadi - but I didn't find one.

As the tide drops and the sandbar rises, Homo sapiens var. shell-collector appears from every crack and crevice, each one carrying his collecting gear, and all hungry for the species that will appear as the tide slowly creeps up the narrow sandbar. Now among the many footprints little bumps appear in the sand, and sticks, spoons or fingers are quick to investigate. But beware! Hairy Mary lives here. This little heart urchinis covered in fine hairy prickles and she surfaces side by side with Strombus aratrum which are amazingly plentiful, as evidenced by my being given three or four, by people who had so many they didn't know what to do with them. They come in a range of lovely colours from vivid yellow in the aperture to the classical bright orange with a black edging. To my joy one pale looking shell proved to be S.aurisdianae, with strong lirations in the aperture at both ends. Very plentiful is the dwarf form of S.campbelli and it pays to inspect every one, as I found S.variabilis, plicatus, canarium and a small vittatus among them. In the muddy areas S.luhuanas are plentiful and a few big colourful gibberulus can be found.

People were collecting olives: elegans, oliva, plenty of caldania, but I remembered to look for the tiny rufofulgurata and it was still there in a sand patch close to the main bar. Round the edges of a small pool in the same area, Vexillum michaui - but I couldn't repeat my previous find of Scabricola ocellata. Two other wee mitres I found might be Cancilla praestantissima and peasei.

The Naticidae are exciting; Polinices pyriformis, mellosus, conicus, mammatus, powisianum and a pure white one very like the last - an albino? or is this peselephanti, or is powisianum a synonym of peselephanti or ----???; Natica vitellus, gaulteriana, fasciata.

Big dark handsome Phos senticos, big bright candy-striped Pupa solidula ubiquitous but pretty Pictonerita oualaniensis; the sand is alive. The rocky shores, the island and the coral reef each houses its own community, and the tide line on the sandy beach is thick with small dead shells. I have collected nearly 200 species in a couple of short stays at this lovely Queensland beach.

SMALL IS BEAUTIFUL

by Margaret Morley

Shell sand taken from Oneroa, Waiheke Island in May this year yielded a Naricava neozelandica Powell 1940 (slightly damaged). It is a delicate, transparent white shell, 3.5 mm in length. The type specimen came from shell sand at Tom Bowling Bay. This species has also been found in 95 metres between Spirits Bay and the Three Kings Islands. I would be interested to hear of other records of Naricava neozelandica, particularly from localities other than the Far North.

Naricava neozelandica Powell 1940

NIGHT DIVING ON THE SAND FLATS AT MATAI BAY

by Ian Scott

After driving up from Auckland in the late afternoon, a calm still night was too good to waste, so Dave Gibbs and I went night diving. There is something magical about being alone underwater at night with just a circle of torch light to keep you company! It also provided a good opportunity to study Amaldas when they were out in the open instead of hiding in the sand.

Amalda depressa was the most abundant species out on the sand in the middle of the bay. Here the water depth was 6 to 10 m and there were several A. depressa per square metre. Adult specimens were small, ranging in size from 9 to 12.5 mm and they were observed crawling along on the surface of the sand. Subsequent dives in daylight hours in the same area found all specimens buried in the sand with at most the siphon exposed.

Amalda australis was also found out on the sand flats, but in shallower water. It was the dominant species in water 2 to 5 m deep, with only occasional specimens in deeper water. Specimens seen were up to 25 mm in size, and were found crawling in the sand with just the siphon exposed.

Amalda novaezelandiae was the dominant species in sand pockets amongst the rocks in the middle and northern side of the bay. They were typically found at depths of 5 to 8 m and were the only Amalda in this habitat. Many specimens were very large, up to 16 mm in size and were found crawling on the surface or just beneath it. Away from the rocks in deeper water some A. novaezelandiae were found sharing the habitat with A. depressa, but these were always much smaller specimens, never showing thickening of the outer lip. In addition they generally had much paler markings. In fact looking at the two populations side by side they do not look similar at all, and further research would be interesting.

Out on the sand flats there were very few species of mollusc. Perhaps the most abundant were tiny Marginella pygmaea which were out crawling on the surface of the sand in their hundreds. This helps to explain why they are so common in wash ups. The shells ranged from transparent white to bright orange. A few Tanea zelandica were seen crawling on the surface of the sand, generally in the vicinity of rocks. The animal of this species is white. Duplicaria tristis were found in colonies, but were not widespread. Several Natica egg rings were seen, but no live specimens found on this dive. However, hermit crabbed specimens of Natica migratoria and Natica sagittata hancockae were seen. A few live specimens of Bulla vernicosa were found, generally in sand areas near the rocks. Amongst the rocks themselves there were many more species.

Of the shells we didn't find that night, perhaps the most tantalising was a broken hermit crabbed Polinices tawhitirahia which Dave found several days later. There were also no signs of any volutes or cassids.

No Amalda mucronata were seen, but from my previous experience these prefer a muddy substratum. At Matai Bay the bottom was always sand, ranging from coarse sand and shell grit amongst the rocks to fine sand in the centre of the bay.

As I said, night diving is a magical experience and our dive lasted nearly two hours. The only thing missing was a hot shower at the end!

ATHOROCOPHORUS BITENTACULATUS - A NEW HABITAT

- by Martin Walker

Otherwise known as the Leaf Veined Slug this rather attractive land slug is native to the North, South, and Stewart Islands. I have most often come across it whilst examining the moist leafbases of (especially epiphytic) flax-like plants (e.g. Astelia, Carex, Collospermum, Phormium) in forest or forest remnants.

D.W. Burton in his 1963 monograph of the genus says, "The species is found only in or near bush, in moist areas with over 50 inch annual rainfall. It is nocturnal and fungivorous and is commonly found at night, eating a black encrusting fungus on the leaves of Pseudowintera axillaris and P.colorata."

I can now report that in Port Charles (annual rainfall 71 inches, 1776 mm) it occurs commonly in damp places well away from bush, the nearest native vegetation being occasional isolated puriri trees bearing epiphytic lilies many metres away. The slugs apparently thrive in the damp shelter afforded by long, overgrown kikuyu grass and are also quite commonly found between the lower leaves of cabbages in our gardens. Perhaps they help control fungal attack on our vegetables? Certainly they are more attractive, benign, and welcome than the ubiquitous, introduced (herbivorous) Arionid slugs.

References:

D.W. Burton, 1963. A Revision of the New Zealand and Subantarctic Athorocophoridae. Trans. Roy. Soc. N.Z., Zool.3 (6): 47-75.

WATER-BORNE COMINELLA

by Martin Walker

The following item I found recently amongst my father's papers. I was with my father that morning in the early 1960's and still remember the strange sight of Cominellas attached upside-down to the surface of the water. I do not recall this note ever having been published before so here in my father's words:

"While I was walking one morning in dead calm water at low tide in Marsden Bay in January I came across numbers of Cominella glandiformis floating upside-down in water 12 to 15 inches deep.

The extended foot made an oval saucer which was supporting the mollusc quite safely so long as no water lapped over the edge of the 'saucer'. When the artificial waves I made caused this to happen they sank at once and began to crawl along the bottom in the usual manner.

I would be interested to hear of others who have observed any further details of this occurrence, particularly as to how the upside-down manoeuvre is first accomplished. Is it just a method of transport when conditions are favourable, which would not be very often, or is there some other significance?" - Jock Walker.

BOUILLABAISSE

o r

SOME GASTRONOMICAL OBSERVATIONS FROM THE KINGDOM OF TONGA

by Nancy Smith

At the beginning of the Grand Shell-collecting Expedition to the Kingdom of Tonga in 1984, the Leader said, "Eat as much as you can, whenever you can, because you never know when ..." All the same, I don't think he meant Margaret Morley to eat raw flat-worms. But although we often worked up a mighty appetite we never starved. We had many feasts and ate delicious things and strange things and unidentified things, and became interested in who was eating what, and what was eating which.

The first shell I picked up in Tonga was a big anadara. Someone had barbequed a great heap of them on the beach by the jetty where the fishing boats pulled in. Although fish and squid and crayfish featured on our menus we weren't offered shellfish.

Round the main island, Tongatapu, acres of coral reef were dead - grey, broken, sour-smelling dead, and we wondered what relationship this had to the number of Tongans who were out at low tide with crowbars and hammers, breaking off every coral head to find the "hula-hula grubs"

hidden deep in the coral. This chiton (name unknown) evidently cooks up into a nutritious meal if you can glean enough of them. I don't suppose they could be any tougher than the packed lunches one guest-house gave us - sandwiches toasted and wrapped in aluminium foil - but the same place made up for that with their delicious papaya scones for afternoon tea.

One day we watched a group of young boys trying to kill a big octopus they had caught on the reef. They were very excited, and when they had beaten it to death with sticks and stones, the finder was accorded the honour of carrying it the long hot walk across the reef to home and, I suspect, a hero's welcome. I don't know how they cooked it, but we sampled marinated raw squid in Vava'u where every dinner was a feast. It was less awful than the marinated raw fish, but I don't like anything out of the sea, except seameal custard.

On a Sunday when the church bells woke us long before breakfast, an early walk to the beach revealed a Tongan Sunday lunch being prepared. A young woman had waded round the shallows and collected a big basinful of "sea-cucumbers" in vivid colours and weird shapes and was busy turning them inside-out to clean them. We had only body-language to communicate with, but she assured me this was a feast in preparation. On this same beach another day I found a pile of Turbo shells and operculums which had been dropped after the succulent contents had been removed. The shells looked like T. setosus and bruneus but all the perks were the same and probably belonged to the setosus.

Sometimes it was embarrassing meeting Tongans on the reefs. Always everyone made friendly overtures, but when they found you were collecting shells, their hard-earned meal was offered up immediately. We met a group of teenage girls out gathering food. It was a school holiday and a very low tide and they were enjoying themselves greatly. Keen to practise their English they opened up their bags and showed me the contents. Everything was edible they said - yes, even the cones. One lass dived her hand into the bag and brought out a big Conus geographus, which she later presented to me as a reward for making them laugh so much. The joke? I said the geographus was poisonous and should be handled very carefully. They poked their fingers into the live mollusc and laughed at the mad Palagi. They also gave me a fine Pleuroplaca filimentosa, a lovely, empty, Cypraea argus and several small shells, but they carefully removed the meat from some Nassa serta and Haliotis before handing them over. In return for their largesse I had to chew on a piece of raw paua and smile. I wished I had something to give them. It was sad to see they had two-inch Charonia tritonis and one-inch clam. That was the only live clam I saw round Tongatapu, though there were hundreds of giant shells about. Perhaps when the clams were abundant the people didn't toy with poisonous cones, or kill the coral to catch the "hula-hula grubs".

While the Tongans were feeding us and the sea was feeding them, the sea creatures were feeding each other. Clusters of drupellas grazed on coral leaving white, dead patches. I counted 23 big handsome Nassarius arcularius eating a dead crab, and a similar group taking dessert from a delicious two-inch strawberry cockle (Fragus unedo) - still alive. I left them their meat but stole their dish. A big Oliva miniacea sticking up out of the sand appeared very pregnant till I discovered it had completely enveloped a Polinices. I guess it would

have spat the shell out after removing the meat, if I hadn't bagged the two in one. My biggest miniacea and my first P. flemingianus. A gruesome sight was a big Conus marmoreus with his head right inside a Terebra guttata, whilst two hermit crabs wearing very nice Strombus dentatus shells, grabbed at the fragments oozing out of the guttata. I searched, but in vain, for a live dentatus. I searched many a sand track only to come upon a starfish. Finally, in exasperation, I flipped one out onto his back and found he had a little Terebra affinis under him. I realized he had been up to the same trick as all good shell hunters, apologised and put him back. After that, whenever a trail led to a starfish, I lifted him up and even dug round a little. There was very often a reward in that, and I ended up with a nice little collection, stolen right out of the mouths of the starfish - I never saw or heard of anyone eating them!

ITEMS OF INTEREST

- Jim Goulstone gives the following corrections to his article on "Waitakere Landsnails" (Poirieria Vol. 13, Number 1):

  "On page 35 I have drawn Phrixgnathus cheesmani (Suter) from Great Barrier Island specimens and say that I only found one specimen at the last minute from Huia. However, that one specimen, on careful re-appraisal, turned out to be a very large old Phrixgnathus fulguratus (Suter). So I didn't find one and neither has Dr Climo seen one in The National Museum collection from Waitakere. I have nearly finished an extensive Hunua and South Auckland survey and it hasn't turned up there either. The one I have drawn from Great Barrier Island is P. cheesmani though, for I have had it checked against the type and I have it from the Coromandel. It is essentially a North Auckland snail which sneaks down the East Coast a way.

  It is on the cards that Suter has made a mistake in some of Cheesman's localities for another of his records, as Gerontia cordelia is fairly certainly not in the Waitakeres either.

- What lives in black coral trees? In the Fiordland sands some of these trees have colonies of the albino form of Maurea punctulata. In one such tree Dave Gibbs found 15 such specimens ranging from pure white to those with remnant brown markings. Roger Grace reports finding spiny lobsters in these trees. A possible reason for this is that the sheer cliff faces in The Sounds offer few other hiding places from predators.

- The Whangarei Shell Club was not to be outdone by our reports of Margaret Morley finding a live specimen of the rare nudibranch Babakina caprinsulensis. One of their members, Kevin Burch, found another specimen on a stony substrate under a small stone in 20 feet of water while diving off Tapeka Point near Russell. When seen it was actively laying eggs, so further specimens may turn up.

- In the albino shells department, Mrs Boswell has in her collection an albino Amalda australis.

- A recent report in the N.Z. Herald claimed studies by marine biologists have failed to find any legal-sized paua in northern waters. This was confirmed by Dr Bob Creese from the Leigh marine laboratory, who said that paua in the north seem to grow rapidly in their first three to four years, but that growth slowed when they reached 100 mm and very few got beyond 115 mm. The legal minimum size for paua (Haliotis iris) is 125 mm. In the South Island they grow more slowly but keep on maturing until they are 150 mm long. He also said that research has shown that the absence of large specimens in the north is not due to paua being taken before reaching maturity. Evidence for this is the study of more than 2000 specimens in the protected marine reserve at Leigh.

  However, the editor does have his own secret colony in a remote bay on Great Barrier Island where a few specimens grow beyond the 125 mm mark. He knows this from measurements made on the empty shells!

- If you are tired of the ordinary scallop (Pecten novaezelandiae) you may be interested to hear that a new scallop called the "queen scallop" (Chlamys patagonica delicatula) is now being sought off the Otago coast. Research has shown queen scallop beds to be extensive, stretching from Banks Peninsula to the Auckland Islands. The present catch is concentrated off the Otago coast with at least six vessels operating. Mr Murray Tait, the export manager of Dunedin-based Skeggs Foods, expected his plant to process between 70 and 100 tonnes of the shellfish, and added that initial overseas response to the scallop had been good. The scallops are collected by trawling rather than the traditional dredging.

- For those of you that collect fossils, Alex Mannering,of Christchurch, has a story with a difference. He, along with several friends, located a fossil Plesiosaur located in a boulder twenty metres up a cliff face. Fortunately this Plesiosaur was of the smallish kind (as dinosaurs go) but still the efforts to extract it from the cliff face and load it on to a truck were enormous. Next followed twenty months of chipping away with electric kanga hammers to remove the excess rock, reducing the Plesiosaur to a mere several tonnes of rock and bone. Several years further down the line they expect to separate out these bones and hence identify the creature! This is the story to tell your friends when they think you are obsessive for spending an hour picking off the calcaveous encrustation on a Muricopsis octogonus!!

- Several people have written to me with information about live Epitoniums. Margaret Morley writes of finding Epitonium minora alive in sand pockets amongst partly buried rocks. They were buried in the sand and when exposed took only 5 to 10 seconds to turn over. The anemone Actinothoe albocinta was nearby (on the rocks) and it is

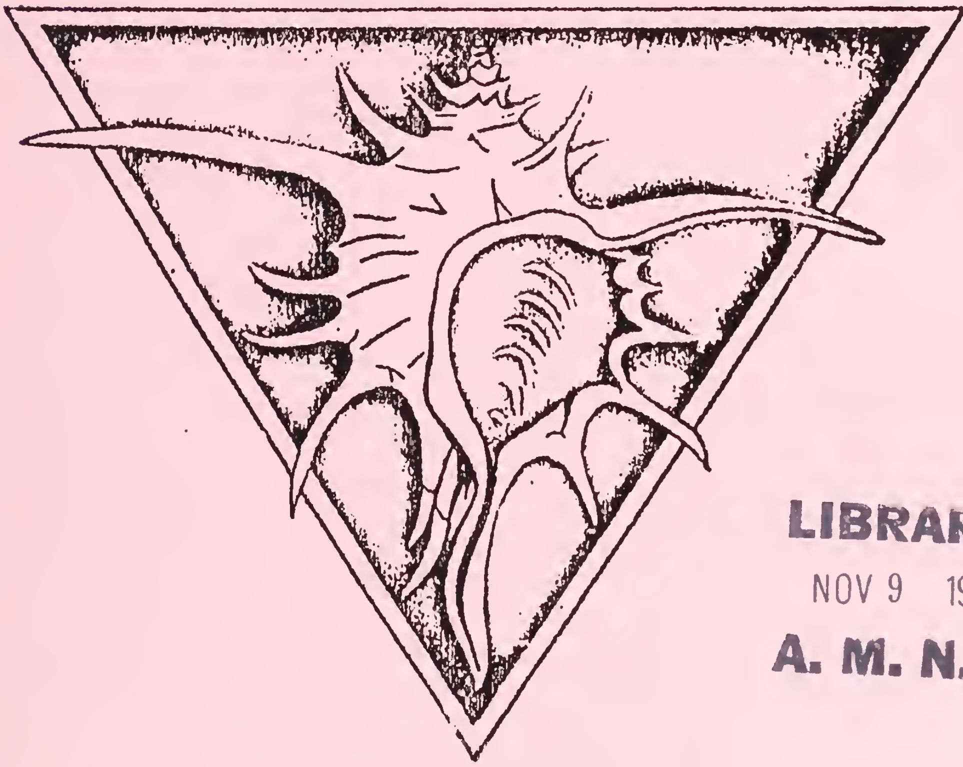
possible that they fed on this. The animal is white with a strong foot enabling the animal to climb, and they exuded purple dye after collection.

Nancy Smith writes of finding _Epitonium jukesianum_ in rock crevices at low tide near deep water. There was usually sand in these crevices and she also mentions the presence of small colourless or grey sea anemonies.

Several collectors mention finding live _Cirsotrema zelebori_ in sand near the extreme low tide mark on beaches, and in several cases they were found by sieving the sand in this area. Any more reports on live collected Epitoniums would be appreciated.

Nancy Smith also mentions that Dr Norman Paschal (Sea and Shore Vol.12, No. 4) has stated that _Epitonium perplexum_ is definitely a synonym of E. _lamellosum_, for those of you lucky enough to have this rare visitor to our shores. Finally, for those of you trying to separate your E. _bucknilli_ from E. _jukesianum_, borrow a microscope and look for spiral striations between the ribs on E. _bucknilli_.

POIRIERIA



Auckland Museum
Conchology Section

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EDITORIAL

With this issue we provide colour plates for the first time, and hope to make this a regular feature of future "POIRIERIA". By using colour photographs rather than colour printing we can afford to do this, although in future issues we will probably restrict this to one or two colour photographs only. Obviously there is a big advantage in identifying shells when they are illustrated in colour, and eventually we hope to cover a wide range of the larger molluscan species. Members are invited to submit suggestions to the editor for future species they would like to see illustrated. I will try as much as possible to make these illustrations tie in with the articles submitted, and if members think the article will benefit from a photograph they should see or write to me in advance.

Also with this issue we are placing advertisements for the first time. While it is not expected that these will ever become a large part of "Poirieria" they will help to defray some of the photographic and photocopying costs. Advertisement costs are
- $60.00 per page
- $30.00 per half page

Rates for smaller advertisements are negotiable. Prospective advertisers should contact the editor:

Ian Scott
25 Halston Road
Auckland 4

CONTENTS THIS ISSUE

DIVING FOR SHELLS IN THE ABLE TASMAN NATIONAL PARK - by Ian Scott.

During January of this year I had the opportunity to travel by yacht through the Able Tasman National Park and to dive in several places ranging from Tata Beach near the cement works in Golden Bay around to Kaiteriteri Beach in Motueka. The area is attractive with its Golden sand and bush clad hills and the sea looking inviting; although it proved to be rather on the cold side to a body adjusted to the warmer waters of Northern New Zealand!!

In all places dived the rocky headlands very quickly gave way to sand at depths ranging from 3 metres to a maximum depth of 13 metres encountered off the seaward side of Adele Island in the centre of the park. The rocky areas were mostly large boulders with very few turnable rocks. The visibility underwater was often reasonable near the surface (up to 7 or 8 metres) but was disappointing in deeper waters as the sand became silty and visibility dropped to only 2 or 3 metres. Fish were not abundant, usually only the odd spotty or Tarakihi; and in general the underwater scene was drab, with much of the seaweed and rock covered in silt.

The underwater mollusca were dominated by bivalves, in particular mussels. From the low tide mark down to a depth of 2 metres every available piece of rock surface was covered by huge colonies of the mussel *Mytilus edulis aoteanus*. These were typically 10 - 20cm in length, and a sugar bag could be filled by standing in one spot! Below a depth of 2 metres these mussels slowly disappeared, although odd clumps were present down to a depth of 5 metres. Scattered amongst these *Mytilus* were several of the ribbed mussel, *Aulacomya ater maoriana* and an occasional *Perna canaliculus*. Interestingly, a few *Aulacomya* were found attached to the underside of rock slabs and were bright orange-yellow in colour. Below the mussel zone the rocks were often bare except for numerous sea anenomes; and in places where sea weed was found it was never luxuriant. These rock slabs in deeper water (6 - 13 m) that could be turned often had large colonies of *Barbatia novaezelandiae* attached to the underside; but in shallower water only a few *Cardita aoteana* or the occasional *Chlamys zelandiae* were found attached. Other bivalves found in sand under rocks were *Corbula zelandica*, *Zearcopagia disculus*, and *Diplodonta striatula*.

In general gastropods were uncommon amongst the rocks. In addition those that were found were typically badly eroded and pitted, making quality specimens hard to come by. *Maurea spp.* were in general not common, except at Tata Beach. In each locality a few *Maurea punctulata* were found and they were consistently larger than Northern specimens, 30 - 36cm in width. Several were found crawling amongst the mussels in shallow water. Several large *Maurea tigris* were found, including some very pale specimens. Unusually, several of these were crawling in the open on the top of large rocks in bright sunshine - rather than hidden under ledges as they are usually found. *Buccinulum spp.* were not common and all, except for juveniles, were eroded. Most were like small *Buccinulum lineum* in colour pattern but had slightly raised lirations following the spiral pattern - I'm not sure of their

I.D., whether *B. pallidum* or yet another form of *B. lineum*. A few *B. vittatum* were also found. Under some rock slabs were many *Maoricolpus roseus*, and in one cleaner channel many *Haliotis virginea virginea*. Of the larger gastropods only a few *Mayena (Ranella australasia australasia)* were noticed.

Where the rocks ended the sand began, and while it was coarse close to shore, it was often silty in deeper water. From the rocks it spread out seawards but was never much deeper than 15 metres, and appeared flat underwater. Of the bivalves found here were many large *Glycymeris laticostata*; plus *Tawera spissa* and *Gari stangeri*. Only a few *Pecten novaezelandiae* were seen, probably because of human predators! A new species for me was a single freshly dead specimen of *Thracia australica novozelandica*.

Gastropods were found on the sandflats in larger numbers than on the rocks. Olives were reasonably common - in shallow water (2-5 metres), *Amalda australis* being abundant, but in deeper water (8-12 metres) were replaced by *A. novaezelandiae*. Numerous freshly dead *Amalda mucronata* were found on siltier substratum in deeper water; although no live specimens were found, perhaps because they are nocturnal. Also crawling on the silty sand were numerous *Austrofusus glans*, *Cominella adspersa*, and *Penion dilatatus*. Freshly dead *Struthiolaria vermis* were common, and also noted were *Alcithoe fusus*, *A. arabica*, and *Struthiolaria papulosa*.

In conclusion I would not recommend this region for diving or shell collecting, but stand to be corrected by later researchers. Perhaps dredging would be easier and more profitable since the bottom is relatively free of obstructions. For the beach collector there were little in the way of washups on any of the beaches I visited. However, the region is very scenic and worth visiting for this reason alone; as you can travel from alpine scenery and mountain lakes to beautiful beaches in a matter of hours.

Seashell Show

PAKURANGA CULTURAL CENTRE

SEPTEMBER 24th AND 25th

REPORT ON THE CONTINUING STUDY OF *Musculista senhousia* (Benson 1842)
by Margaret Morley

In Poirieria (Vol. 14, # 1 April 1985) Dr R. Willan wrote an article on the arrival of *Musculista senhousia* in New Zealand. In December 1985 his paper (1) on this subject was recieved by the Auckland Institute and Museum. Many details are given including taxonomy, biology and method of introduction from Japan.

As well as the Tamaki estuary, Thames, and Beachlands *M. senhousia* has since been found at Waiheke Island, Milford Beach, Snells Beach, Whangarei, Port Jackson Coromandel Peninsula, and Great Barrier Island. More recently it has been found at Tutukaka, Otehi Bay and Opua in the Bay of Islands, Mangonui, and Paua in Parengarenga Harbour. The map shows the densities and whether wash ups or alive. Some finds were a surprise, for example Medlands on Great Barrier Island is an exposed surf beach. Are the shells living in the brackish estuary? This seems the most likely place, the water varies here between one and three metres and does not dry out at low tide. *M. senhousia* has established in a similiar low salinity habitat in the upper reaches of the Swan River, Perth, Australia. See diagram overleaf.

In January 1986 extensive subtidal beds were found at Bucklands Beach. Densities in these beds were 1200 to 1820 m^2; shell size a maximum of 30mm. There was no attachment to the rock but the specimens were living in a strongly woven byssal mat resembling turf. These subtidal beds thrive near the channel higher up the Tamaki estuary, approximate population of 18 million. Very fine silt collects in the byssus creating a shiny surface. Within this silt live large specimens of *Theora lubrica*, to 9mm.

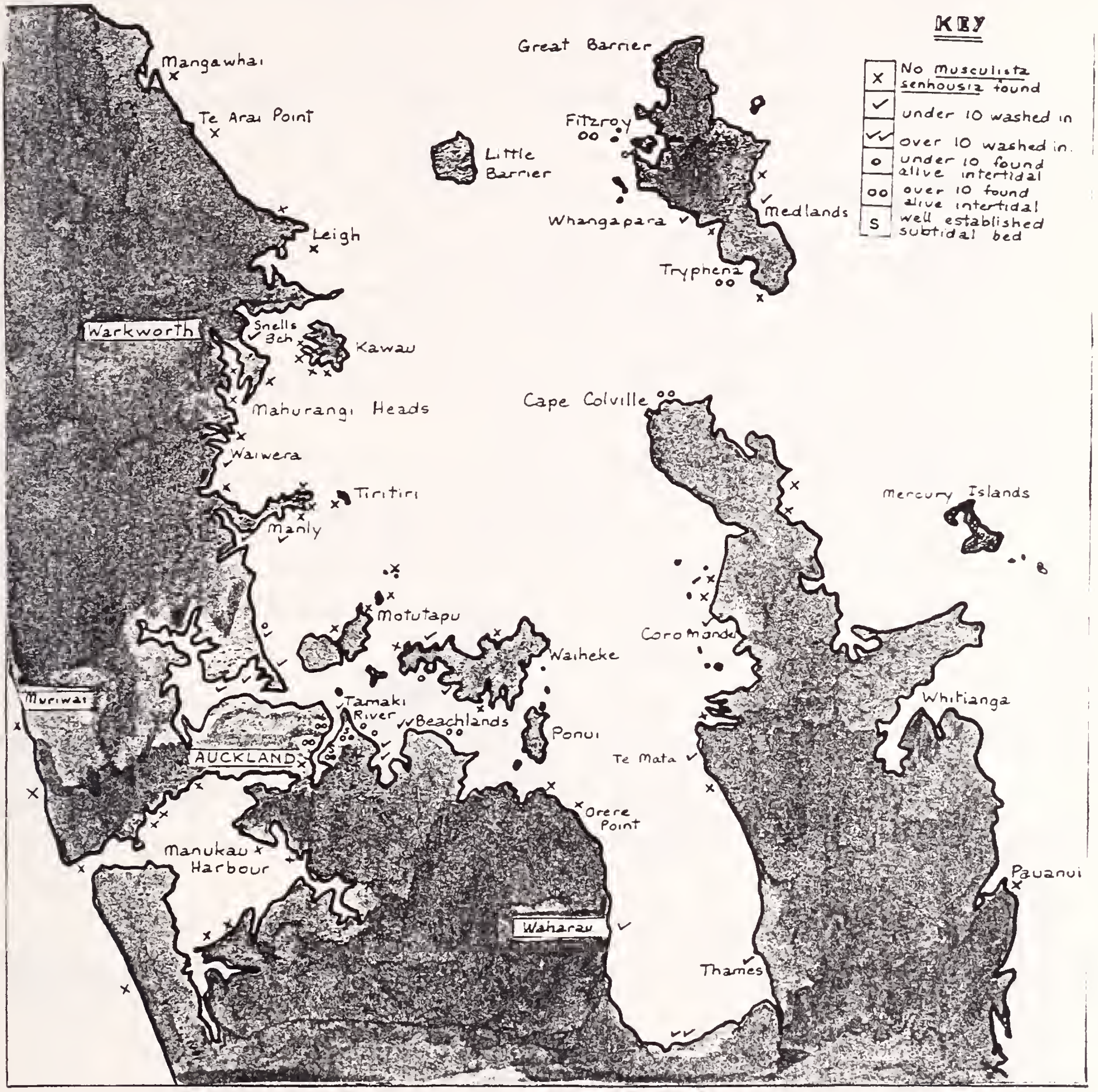
Between the mid-tide beds and the subtidal beds in the Tamaki are no *Musculista senhousia*, of which I have no explanation for. While pondering on the problem an interesting fact has emerged. *Xenostrobus pulex*, our native little black mussel, is considered to live at mid or high tide level. However, during the dredging for the Beachlands marina clumps of *Perna canaliculus* have washed in. Within the byssus are living *Xenostrobus pulex* so it appears that this species has also two distinct habitats.

Since April 1985 I have been monitoring the intertidal area of Bucklands Beach. This is a rocky area between the channel and the road. Four quadrats were denuded and marked with nails driven into the sandstone. The material from each quadrat was seived and specimens counted. The density of *M. senhousia* varied between 2400 to 4000m^2 and *Xenostrobus pulex* between 80 to 2510m^2. These quadrats have been re-examined at monthly intervals. The results yield little information on the recolonisation of *Musculista senhousia* which did not occur in all quadrats. See graph overleaf.

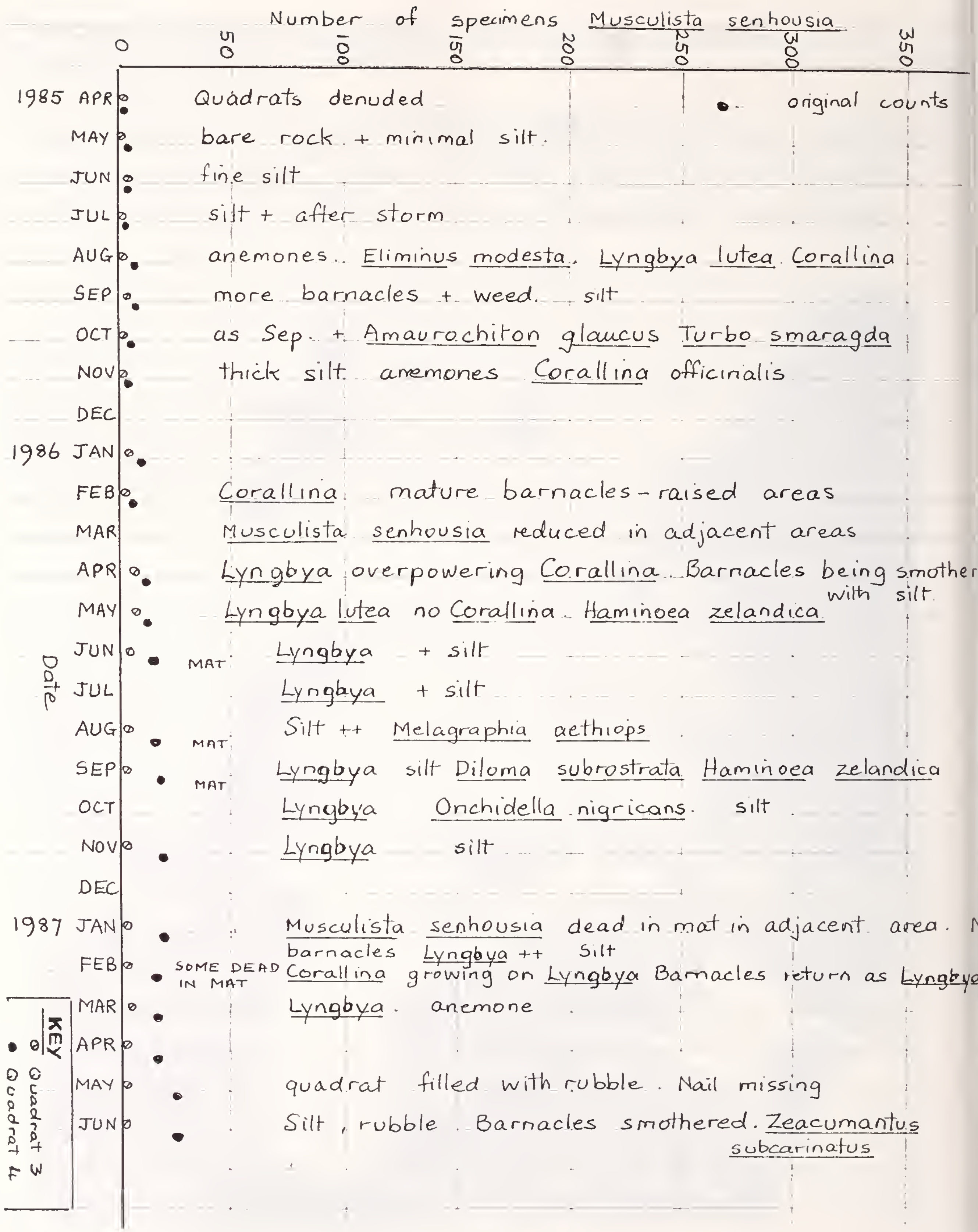
The sequence of organisms recolonising, however, was demonstrated. The main message has been the very slow rate of recovery even after three years. Two of the quadrats are visible from several metres, even ignoring the nails. If the intertidal area is so finely balanced does driving a vehicle across a beach cause permanent damage similiar to that when

the perma frost is broken in the Antartic? When you have deep footprints in the *Zostera* mudflat do they stay forever?

MAP of HAURAKI GULF showing distribution of Musculista senhousia. It has also been found at Whangarei, Tutukaka, Bay of Islands, Mangonui & Paua.



Following hot dry weather in January and February 1986 there was a dramatic change over the whole area . Previously heavily beds of *M. senhousia*, up to $4000m^2$, were decimated to bare rock. Small isolated patches remained in depressions, even here on close inspection shells were dead within the mat.



Similiar disappearances remained occured in Japanese studies(3). Statistics on shells dying are unreliable as neither *Musculista senhousia* nor *Xenostrobus pulex* appreciably open when they die. Joined valves in a mat look alive but when broken can be empty.

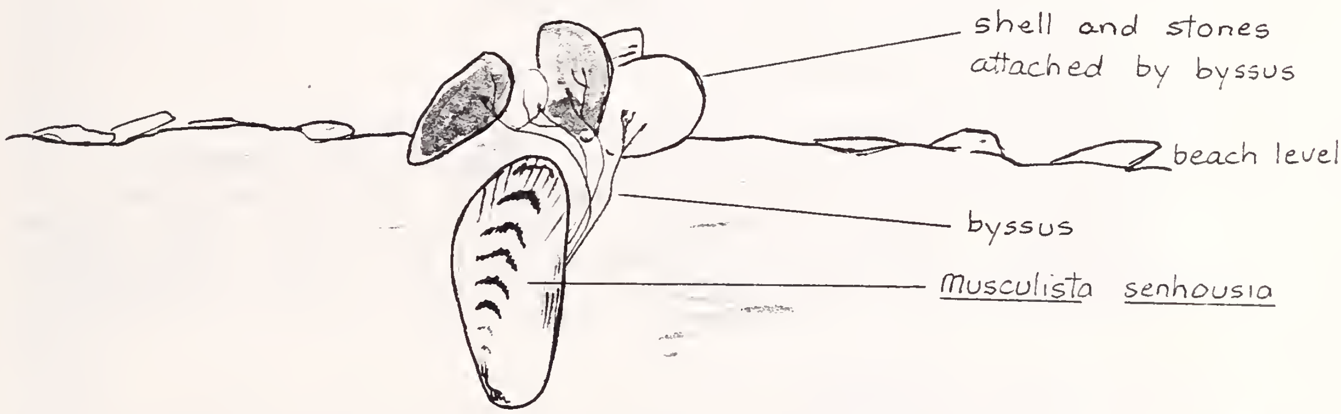
In contrast to the *Musculista senhousia* the *Xenostrobus pulex* thrived on the summer weather and produced spatial competition. The average number per square metre increased from 900 (April 1985) to 1600 (February 1986), their size also increased.

Other density checks of *Musculista senhousia* in sandy intertidal beds near Panmure also showed decreases in March 1986. The high densities of April 1985 have not returned, the average number of *M. senhousia* m^2 during 1987 was 330.

In most of the counts there are usually a few juveniles indicating that this species is able to reproduce throughout the year. Even in specimens 1-2mm found in sievings or shell sand the early development of the characteristic 'zig zag' colour pattern gives positive identification.

So far *M. senhousia* poses no threat to the existing biota, however, heavily populated beds could do so if they occured in places like the Parengarenga Harbour. Very little is known about the existance of subtidal beds. So far subtidal beds have been located by feeling for very fine, soft, slimy sediment between the bare toes when wading! A reliable clue to the presence of *M. senhousia* are small clusters of debris which stand proud above the typical surface of the beach on stable intertidal sand/gravel flats. See diagram.

Section to show method of stabilisation on intertidal sandy flats.



The third likely habitat is among *Corallina officianalis* turf, or among beds of *Xenostrobus pulex* beds.

I would be pleased for data either on changes in existing beds or from records of new localities for this species (what would be particularly interesting are records from the Manukau and other West Coast Harbours). This type of information led to the pinpointing of *M. senhousia* at Blackpool, Waiheke Island.

REFERENCES
1 Successful establishment of the Asian Mussel *Musculista senhousia* (Benson in Cantor 1842) in New Zealand. Auckland Institute and Museum 22 : 85-96. Dec. 1985.

2 Additional Data available

3 Kituchi and Tanaka 1978.

AKNOWLEDGEMENTS
Thanks to Dr W. Willan for his suggestions and help.

Thanks to the many members of the conchology section for their data and observations.

EDITORS NOTE
The shells mentioned in this article will be displayed at a club meeting late this year. For the benefit of out of town members, three colour photographs of shells from the Penniket collection have been included.

THE GENUS *Cellana* IN NEW ZEALAND by J. R. PENNIKET

There are many families of molluscs that come under the general name of limpet. The most often so called being the Patellidae, Acmaeidae and Lepetidae which are the true limpets, but also the Calyptraeidae, Capulidae, Hipponicidae, Siphonariidae, and others less well known, even some not even limpet-like in appearance.

Here we will review the New Zealand members of the Patellidae - one section of the Superfamily Patellacea (comprising the Patellidae, Acmaeidae and Lepetidae).

There are species of the Patellidae in all oceans and seas except both coasts of North America, the Carribean sea and South America north of Chile and Patagonia.

It is not intended to go into the anatomical differences which distinguish the families, suffice to say the differences are clearly described in "Indo Pacific Mollusca vol. 3" in an article by Dr Powell; for those who wish to enquire further. Students will find a wealth of information on limpets in general.

Here in New Zealand we have nine species of Patellidae, one of which, *Cellana strigilis*, has six recognised subspecies ranging into the subantartic.

Shell characteristics of these New Zealand Patellids are clearly recognisable and little difficulty will be experienced in identification. However, two basic rules should be remembered and will make species more easily understood. Shells from lower tidal zones or exposed sites are usually flatter - lower in elevation - than those further up the rocks. In addition some species vary considerably from locality caused assumedly by ecological differences and often in colour according to the substrate upon which they are found.

Colour can also vary considerably influenced both by the nacreous layers applied internally in older shells and by the extent of erosion caused by the abbrasive nature of sand in suspension in rough seas.

Powell sums up the situation concisely "Limpets tend to vary greatly in size, shape, sculpture and colour patterns due to the ecological factors involved, particularly relative to exposure to wave stress and nature of substrate. Often specific limits are apparent only when an extensive series from a number of stations is studied".

It is from an extensive series of shells from localities around New Zealand that I have selected the examples presented here.

We commence examination of the collection with the commonest and most widely distributed species.

Cellana radians (Gmelin 1791) North, South and Stewart Islands.

Extremely variable in size, colour, elevation. There are several forms with intergrades probably caused by local ecological conditions. The best known form is mainly from the South and Stewart Islands, however, normal and 'perana' can be found living adjacent at times, particularly at the Moeraki Boulders in North Otago where 'perana' occurs on dark coloured rock and the normal *radians* on light coloured sandstone. The 'earlii' form of Reeve 1855 is a colour pattern seen in juvenile shells where connecting bars of colour are clearly in view between the ribs. This colour is very close to the surface and as the shell matures is destroyed by erosion. In the 'decora' form, a rather vague and unreliable form, colour consists of radial lines only. The species grows to 54mm.

CAPTION 1
TOP ROW 1. 'PERANA' FORM FROM TIMARU, NOTE THE DARK EDGE SHOWN IN THE INTERIOR VIEW.
2. 'DECORA' FORM, THE MOUNT, TAURANGA.
3. OMAHA BEACH. L.H. SHELL IS FROM THE NORTHERN END FOUND ON GREYWACKE. THE R.H. SHELL IS FROM THE SOUTHERN END FOUND ON SANDSTONE.
BOTTOM ROW
4. 'EARLII' FORM, TRYPHENA HARBOUR
5. KAIKOURA
6. WAIKOKOPU, HAWKES BAY.
7. ARAMOANA, OTAGO.
8. SHAG POINT, NORTH OTAGO.

Shells exhibited
1. *C. radians*, Paxton Point, typical form, Great Exhibition Bay.
2. 'perana' form from Timaru.
3. 'earlii' form from the South end of Rarawa Beach
4. 'decora' form from the Mount, Tauranga.
5. a very tall shell, from Cape Maria van Diemen.
6. very dark shells from Tom Bowling Bay.

7. heavily sculptured from Spirits Bay
8. Mainganui Bluff, Dargaville area.
9. Poor Knights Islands, a very tall shell.
10. typical and 'earlii' form from Tryphena, Gt. Barrier Island.
11. Little Barrier Island, from boulder bank on grey rock.
12. North end Omaha Beach on greywacke rocks.
13. South end of Omaha Beach on sandstone rocks.
14. Waikokupu, Hawke Bay, unusual colour form.
15. Marfells Beach, Cape Cambell.
16. Kaikoura, typical of this area.
17. *C. radians* and 'perana' form, Shag Point, North Otago, on dark coloured rocks.
18. Shag Point on light coloured sandstone.
19. *C. radians* and 'perana' form, Aramoana, Otago Harbour - one shell very elevated.
20. Typical form, Aramoana, Otago Harbour
21. almost 'perana' form, St. Kilda Rocks Dunedin.
22. 'perana' form, Rungaringa rocks Stewart Island, a very tall shell.
23. 'perana' form, Haast.
24. unamed form from Fox River shingle.
25. similiar to 24 but on Riverton rocks.

CONCLUSIONS

A widely distributed species, the typical form mainly from the North Island often displaced on dark substrates in the colder South Island waters by the 'perana' form. A smaller and unamed form occurs in Southern and west coast areas, perhaps from brackish waters? There seems to be little justification for the form name 'decora'. An extremely variable species, both in elevation and colour.

Cellana flava (Hutton, 1873) - The golden limpet, at one time considered a subspecies of *Cellana radians*. Easily the most colourful of New Zealand *Cellana*, limited to the coast between East Cape and North Canterbury, living intertidally, often on limestone rocks where it sits in deep 'pits' eaten into the substrate - often making collection difficult without damage to the lip. Juveniles sometimes show black radial lines, old shells are often heavily eroded. Shells are known up to 66mm.

SHELLS EXHIBITED.

26. *C. flava*, East Cape Road.
27. Castlepoint, note the black radial lines on the juveniles.
28. Mahia peninsula
29. Marfells Beach, near Cape Campbell
30. Kaikoura

CONCLUSIONS

A very stable species, often heavily eroded. Good adult shells uncommon.

TOP ROW 1. *Cellana stellifera*, RINGARINGA BEACH, STEWART ISLAND
2. *C. stellifera*, ARAMOANA, DUNEDIN.
3. *C. flava*, MAHIA PENINSULA, JUVENILE IS FROM CASTLEPOINT.
BOTTOM ROW 4. *C. denticulata*, THREE KINGS ISLANDS.
5. *C. ornata*, SOUTH BAY, KAIKOURA.
6. *C. ornata*, RINGARINGA BEACH, STEWART ISLAND.
7. *C. ornata*, Awhitu, Manukau Harbour

Cellana stellifera (Gmelin, 1791). The Red Limpet normally found at or below lowest tide in open coastal situations. An almost round shell of low profile. An interesting variant at one time given subspecific importance 'phymatius' has a white to yellowish star at the apex which in the fully developed version extends rays to the margins. This is the scarcest mainland species of *Cellana*, growing to 70mm, and often heavily encrusted. It is distributed throughout the North, South and Stewart Islands.
SHELLS EXHIBITED.
31. typical *C. stellifera* from Poor Knights Islands.
32. 'phymatius' form, Tarakohe, Golden Bay.
33. the outpost, Leigh Harbour.
34. Open Bay Islands, South Westland.
35. 'phymatius' form, Aramoana, Dunedin.
36. typical form, Aramoana, Dunedin.
37. typical form, North end of Ringaringa Beach, Stewart Island, a very tall specimen.
38. 'phymatius' form, Ringaringa, Stewart Island.
39. *C. steliffera* Ringaringa 'nugget', Stewart Island, an extremely tall shell from a high tidal pool showing a small 'phymatius' marking on the apex.

<u>CONCLUSIONS</u>

This species has a much wider distribution than recorded by Powell, and is uncommonly collected because of it's favoured

habitat at or below low tide. Probably more plentiful than it's occurence in collections would indicate.

Cellana ornata (Dillwyn 1817). Another widely distributed species found throughout the North, South and Stewart Islands where it is abundant in mid to upper tidal areas. Powell indicates mid to lower zones but in my experience the higher zones are favoured making it the most often found *Cellana* species found within the splash zone. A very distinctive 'ornamented' sculpture make this species well named. Normally without much variation but occasionally abberant shells are found with as yet no suggestion as to the cause. Grows to 50mm.

SHELLS EXHIBITED.

40. *C. radians*, Matapouri, Northland.
41. Sail Rock, South of the Hen and Chicken Islands, Northland East Coast.
42. Little Barrier Island.
43. Shoal Bay, Tryphena, Great Barrier Island.
44. North end of Omaha Beach.
45. Awhitu, Manukau Harbour, one shell an abberant specimen.
46. Mahia peninsula.
47. Waikokopu, Hawke Bay.
48. Pukerua Bay, Wellington.
49. Island Bay, Wellington.
50. South Bay, Kaikoura.
51. Kartiki, North Otago.
52. Shag Point, North Otago.
53. Ringaringa 'nugget' Stewart Island, three shells showing unusual pattern.
54. Caswell Sound, Fiordland.
55. Open Bay Islands, South Westland.

CONCLUSIONS

A widespread and common species with no named forms. Specimens from sheltered localities where erosion is not a problem can be quite beautiful.

Cellana denticulata (Martyn 1784). The Cook Straight Limpet. The distribution is centred on Cook Straight but the species can be found as far North as the Three Kings Islands on offshore Islands, Capes and prominences that jut out into cold clear water. A handsome shell sculptured with brown scaley ribs but often extensivel eroded. Interior margins often beuatifully 'dotted' dark brown at the extremity of each rib. The animal is prized by the maori as a fresh snack to be eaten on the spot. Kaikoura to the Three Kings Islands, growing to 74mm.

SHELLS EXHIBITED.

56. *C. denticulata*, Three Kings Islands.
57. Lottin Point, East Cape area.
58. Cape Palliser.
59. Island Bay, Wellington.
60. Cape Campbell.
61. Atia Point, Kaikoura.

CONCLUSIONS

A handsome species showing little variation, lives in situations with clear cold water.

The *Cellana strigilis* series. A group of geographical subspecies ranging from the nominate subspecies on Campbell and Auckland Islands to further subspecies on the Antipodes Islands, the Bounty Islands, the Snares Islands, the Chatham Islands and the Southern half of the South Island. All these subspecies have developed in isolation over a long period of time from a common ancestor somewhere in the Southern ocean. All become eroded with age, interiors become clouded with callus.

TOP ROW 1. *Cellana strigilis bollonsi*, ATIPODES ISLANDS
2. *C. s. flemingi*, SNARES ISLANDS.
3. *C. s. oliveri*, BOUNTY ISLANDS.
4. *C. s. chathamensis*, SOUTH EAST ISLAND, CHATHAM ISLANDS.

BOTTOM ROW 5. *C. s. strigilis*, CARNLEY HARBOUR, AUCKLAND ISLANDS
6. *C. s. strigilis*, PERSERVERANCE HARBOUR, CAMPBELL ISLAND.
7. *C. s. redimiculum*, ARAMOANA, OTAGO.
8. *C. s. redimiculum*, PAPATOWAI, SOUTHLAND.

Cellana strigilis strigilis (Hombron and Jacquinot 1841). The nominate subspecies from the Campbell and Auckland Islands, large, solid, and broad, the apex one forth from the anterior end. Strongly ribbed, young shells show yellowish spots, streaks when held in strong light, grows to 80mm. Our largest species.

SHELLS EXHIBITED

62. *C. strigilis strigilis*, Perserverance Harbour, Campbell Island.
63. *C. s. strigilis*, Carnley Harbour, Auckland Islands.

Cellana strigilis bollonsi Powell 1955. Antipodes Islands. A narrower subspecies with more rounded ribs. I have insufficient specimens to comment further. Grows to 64mm.
64. *C. s. bollonsi*, Ringdove Bay, Antipodes Islands.

Cellana strigilis chathamensis (Pilsbry 1891). Large, solid with a finer colour pattern that varies considerably according to the nature of ther substrate. The closest ribbed of the subspecies. Grows to 70mm.
65. *C. s. chathamensis*, South East Island, Chatham Islands.

Cellana strigilis flemmingi Powell 1955. The closest related to the mainland subspecies *C. strigilis redimiculum* but narrower. Young shells have an attractive blue ground colour between the ribs. Adult shells are very often heavily erroded, apex at one forth to one fifth from the anterior end. Grows to 60mm.
66. *C. s. flemingi*, the Boat Harbour, the Snares Islands.

Cellana strigilis oliveri Powell 1955. A smaller narrower shell with the apex close to the anterior margin. The one specimen shown is heavily eroded but a typical variation in shell morphology can be expected. Grows to 57mm.
67. *C. s. oliveri*, Bounty Islands.

Cellana strigilis redimiculum (Reeve 1854). The Otago Limpet. Large, solid, ovate, about 20 radial ribs, an orange brown in clean specimens but varies with substrate. Juveniles typically show a cloudy blue ground colour, older shells are often eroded with a heavy milky callus inside. Lives from Kaikoura to Stewart Island and up the West Coast to at least as far North as Haast.
68. *C. s. redimiculum*, Otia Point, Kaikoura.
69. Aramoana, Otago Harbour.
70. Horomamae Island, Stewart Island, these shells are extremely elevated.
71. Evening Cove, Stewart Island.
72. Papatowai, Southland.
73. Port Pegasus, Stewart Island.
74. Shag Point, North Otago.
75. Goose Bay, Resolution Island, Fiordland.
76. Caswell Sound, Fiordland.
77. Haast, South Westland.
78. Open Bay Islands, South Westland.

We must note in practically every species we find odd shells of greater elevation than the normal - in particular in trays 5,19,22,37,39,57,61,70, and 73 - indicating such specimens are unusual but not rare. All come from highest tidal zones where exposure at low tide is longer. Powell suggests these shells cling tightly to the substrate to prevent moisture loss and dehydration, the resultant muscular tension pulling in the shell periphery making a shell of smaller diameter but taller in order to achieve the same animal bulk.

WHEN IS A SHELL COLLECTOR NOT A SHELL COLLECTOR, BY ISOBEL RIGDEN.

Our friend, Ann, from West Palm Beach, Florida, was a keen shell collector more than 20 years ago. Many of the best American and Carribbean shells in our collection are from parcels she sent when we were exchanging with her betweeen 1968 and 1974.

Times and circumstances change. Ann found club members in her area were more interested in owning and displaying the most expensive and rare shells they could aquire rather than in understanding the ecology of the seashore and inter-relation of the different species. Then, her family growing up, she rejoined the workforce and had little time for shelling close by, or further afield. For many years her quite extensive collection remained packed away in boxes, unseen and untouched; but she did not want to sell it off bit by bit to dealers and her now grown family did not want it. What to do? In their new small unit even the boxes were rather an embarassment.

Then, through her son's involvement with a fairly young college, established within the last 15 years, she found a 'home' for her shells. The college would be greatful for her collection, especially as it dealt methodically with both coasts of Florida and extended to Mexico, Costa Rica, Equador, Peru, Brazil, the Carribea and further afield to India, Iceland, Australia, and New Zealand, and other world wide locations. Cataloguing had to be brought up to date --- over 70 pages of shells, books, publications, shell cases, corals etc... a long job, but finally accomplished. Now her shells are able to be used by the students and she has more space at home.

So once again there was the temptation to look for shells, a chance for a holiday in Dominican Republic with a group of shellers. She wrote, "The D.R. trip was justified by me telling myself that I was not collecting for me --- but --- since I had not sent shells from the Atlantic when I was trading with you, this was the opportunity."

Recently Ann visited us and we enjoyed getting to know her and introducing her to a little of our countryside and seashore. Chilly winds rather spoilt our beaches, more noticeable as she came to us from near Mackay, Queensland, where she had stayed with another 'shelly' friend. However, she found a few shelly treasures (?) at Spirits Bay, Paua, Rarawa Beach and Taupiri Bay.

Too soon it was time for her to go again, but we have work to do -- some very attractive specimens from the Dominican Republic and elsewhere are waiting to be catalogued and added to our collection.

And the shells she found here and in Queensland? Where will they find a home? Ann has a glass-topped table with a space underneath the glass to put shells on felt or cloth -- not glued in geometric patterns, but set out loosely and able to be changed from time to time. A good compromise, I think, for a non-collecting sheller who still loves to fossick.

....

MAHIA PENINSULA, by DAVID GIBBS.

Over the past couple of years I have visited Mahia Peninsula a number of times, adding many specimens to my collection (and other collections) from this interesting place.

Mahia is approximately half way between Gisborne and Napier and seems to be the 'meeting place' for Auporian and Cookian species. *Haliotis virginea crispata*, *Cominella quoyana*, and *Sassia parkinsonia*, are some of the Northern species present; while *Argobuccinum pustulosum tumidum* are typical of the Southern region.

Although I have not had much success beach collecting at Mahia, large washups occasionally occur with good specimens of *Alcithoe fusus*, *Xenophalium labiatum* (*labiatum* form) and the odd *Aeneator otagoensis*. *Trivia merces* can also be found amongst beach drift on the Northern side - ask Norman Douglas for directions!

Low tidal collecting is not that exciting, but good specimens can be found of *Cellana flava* (some with black rays on an orange background) and also *Buccinulum colensoi* (black banded form).

Diving is considerably more profitable, particularly on the Northern side, but access to the water is a bit of a problem. At low tide vast areas of papa reef are exposed with waves breaking on the edges making making it very hazardous getting into the water. However, when the winds are from the South or South-West the waves are virtually non-existant, making for a safer entry.

Once in the water a swim of some 30 metres is required to get away from the rather shallow barren sea floor affected by the usual waves. Descending to a depth of around 20 feet, the kelp is very thick and turnable rocks abound. Under these *Halitis virginea crispata* and occasionally *Chlamys zelandiae* can be found. Huddled at the base of the larger boulders are good numbers of *Haliotis iris*. Proceeding further seaward the depth slowly increases and the turnable rocks become fewer, being replaced by ledges and "overhangs". This is the habitat of *Maurea punctulata* and the prized *Maurea tigris*. Crayfish of smallish size, along with large brown Moki and the odd 6 foot conger eel share this habitat. *Argobuccinum pustulosum tumidum*, although not of great size (the largest collected being 85mm and average size around 50mm), are quite plentiful, hanging upside down amongst sponges under the larger overhangs. Also found under the ledges are 2 forms of *Buccinulum lineum* (form *sufflatum*) and *Buccinulum fuscozonatum;* although *B. fuscozonatum* is a lot harder to find as the shells are very heavily encrusted in Bryozoans and *Corallina* paint and hence blend into the background.

At about 40 feet the seafloor reverts back to flat rock with crevices and channels filled with sand. In these sand channels I have found live *Mitra carbonaria*, although I have only taken one as they are very heavily encrusted and have obvious growth flaws. Also in these channels are partially buried *Cominella quoyana* and hermit crabbed shells of *Cominella excoriata tolagaensis;* the latter obviously living

further out as the shells found are very worn. In the crevices I have found many Cabestana ; the latter obviously living further out as the shells found are very worn. In the crevices I have found many *Cabestana spengleri*, a couple of *Ranella australasia*, and single specimens of *Sassia parkinsonia* and *Cymatium parthenopeum*.

The Western side of the peninsula is not as good for diving. The visability at best would be 10 feet and the depth rarely exceeds 25 feet. Also stingrays frequent the area, sunbathing in the shallow calm water. Hence I usually dive this side only when the winds are wrong for the Northern side. The seabed is similiar to the Northern side, but there are more turnable rocks and not so many ledges. *Maurea tigris* is present, but *Argobuccinum* are very scarce - I have found only one specimen to date. *Buccinulum fuscozonatum*, *B. lineum*, and *B. colensoi* are more common on this side but the specimens are not as good.

Over the past 5 years (4 trips) I have collected about 40 species from Mahia. In the near future I hope to add to this by dredging and diving the Southern end of the peninsula.

EDITORS NOTE

The shell referred to as *Buccinulum fuscozonatum* is that described by Suter in 1908. It is not the shell illustrated by Powell in 'New Zealand Mollusca' as "*Buccinulum lineum fuscozonatum*". This shell is an axially ribbed form(?) of *B. lineum* found on offshore Islands and very rarely on the mainland; typically found amongst kelp holdfasts at 12 to 25 metres by divers. The following photograph should clarify the issue. Note the characteristic pustulose sculpture of *B. fuscozonatum*. *B. fuscozonatum* has been found only as far North as Te Araroa on the strip of coast leading to the lighthouse, although a specimen nearly identical to *B. fuscozonatum*, as yet not identified, was dredged out of Houhoura Harbour on the Northland East coast.

TOP ROW *Buccinulum lineum* (AXIALLED FORM - 25 TO 36mm)

P.T.O.

LEFT THREE SHELLS - FLAX ISLAND, MOKOHINAU ISLANDS AT 25m.
middle shell - NEEDLE ISLAND, MERCURY BAY AT 15m.
right two shells - GREAT MERCURY ISLAND AT 13m.
MIDDLE ROW *Buccinulum lineum* (AXIALLED FORM - 25 TO 40mm)
left three shells - BURGESS ISLAND, MOKOHINAU ISLANDS AT 25m.
right four shells - AMODEO REEF, TRYPHENA HARBOUR AT 16m.
BOTTOM ROW *Buccinulum fuscozonatum* (25 - 33mm)
ALL EIGHT SHELLS COLLECTED ON THE NORTHERN SIDE OF MAHIA PENINSULA AT 7 TO 13 metres DEPTH.

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SHELLFISH AND RATS, BY W.P. THOMSON.
(from information supplied by Mr E.I. Hollis and Mr A.H. White).

How is it possible to link shellfish and rats? That is the natural question that would arise in the minds of most people; information supplied by the above mentioned members of the conchology section: an association no doubt very gratifying to the rats, but hardly likely to be appreciated by the shellfish.

Mr Hollis reports that, on a recent holiday in Rotorua, he and Mrs Hollis visited Mokoia Island which lies out in the middle of Lake Rotorua, making the journey in the regular tourist launch which makes trips to that historic Island. While there they noticed great heaps of empty shells of the fresh-water mussel *Hydridella menziesi* lying in places near the lake shore. They also noticed that most of the shells were broken at one end which rather spoiled them as collectors specimens.

Wondering how the shells came to be there in such great numbers, and in such condition, they asked the launch proprietor about them, and were amazed at his answer. What he stated was from his own observations, and, as he was a University trained man holding a B.A. degree they were to be relied upon.

Great numbers of water rats live burrowed in holes just above the water line on the shores of the Island, and he has watched the rats swim down to the bottom of the lake, even to 8 or 9 feet down, and come up with fresh water mussels in their mouths. On occasions, if the sun happened to be shining, the rats would simply drop the mussels down on the ground in the open exposed to the suns rays; they would then just sit back and patiently wait for the shells to open, when in they would dart to make a meal of the animal.

Mostly, however, they would be too impatient, or if the weather was not helpful for these tactics, they would break up the shells with their teeth, always attacking them at the posterior end. The launch proprietor stated that to his knowledge the fresh-water mussel was the staple diet of the water rats of Makoia Island.

On hearing of the above interesting observation, and seeing some of the shell specimens from Makoia Island, Mr White was reminded that some years ago, while visiting the Hunua Falls, about 30 miles South of Auckland, he found a sandbank below the falls on which quite a number of *Hydridella* shells were found, possibly carried and opened there also by water rats.

Fresh-water mussels are not the only diet of water rats however, for Mr White also recalls that many years ago he observed above high water mark on the banks of Maungamaunga Roa River, near Howick, several heaps containing 50 or more *Amphibola crenata* shells. Every shell had been broken into by rats, and it was obvious that they were old hands at the game. The shells selected by them were all half grown, apparently because they would be thinner and thus easier to break into by the rats than would adult shells: and the break was not at the lip as one might have expected, but, in every case about half way round the body whorl right where the animal would be.

EDITORS NOTE : This article is possibly from an old issue of Poirieria. Can anyone identify it's source?

ITEMS OF INTEREST

The following are some Southern Locality Records established by David Gibbs and Ian Scott this year:

Balcis articulata - Lottin Point, burrowing in sand under rock slab at 5 metres.

Clanculus peccatus - Lottin Point, underside of Rock slabs at 5 to 10 metres.

Pterotyphis eos eos - Lottin Point, underside of Rock slab at 5 metres.

Pterotyphis eos paupereques - Volkner Rocks, White Island, under rock overhang at 25 metres.

Liniaxis sertata - Volkner Rocks, White Island, hermit crabbed in rubble at 25 metres.

Morula smithi - Volkner Rocks, White Island, under rock overhang at 25 metres.

Thoristella oppressa - Northern side of East Cape Lighthouse, under rocks at low tide.

Agnewia tritoniformis - Mayor Island, hermit crabbed in kelp holdfasts at 12 metres.

Bullina lineata - Mayor Island, crawling on sand at 10 metres.

Natica migratoria - Mayor Island, hermit crabbed at 10 metres on sand.

If other members have found these species even further south than this please write to the Editor. We always welcome for publication any locality records that extend those given by Powell in "N.Z. Mollusca".

** John Murphy has a favourite tropical shelling place at Mauke. Mauke is a small atoll about one hours journey by air North East from Raratonga, and is the Eastermost of the Cook Islands. The Island is very flat and consists of old reefs and basalt dating back to 17 million years. John has been there four times, shelling the reef between Cove Lodge and the boat harbour. He reccommends Tiase cottages for clean comfortable accomodation. Shells he has found there include 15 species of *Conus*, 10 species of *Cypraea*, 6 species of Mitridae, as well as Muricidae, *Nassarius spp.*, and other shells.

On one particular occasion, 16th of October, John noticed an oily looking substance in low tidal rock pools around midday. Within half an hour this substance had spread and covered a large area. It had a yellowish tinge and dissappeared after an hour. He wonders if this was due to coral spawning.

** Bruce Hazlewood is intrigued by a couple of *Semicassis pyrum* that have been trawled in recent months at 600 metres off the Eastern side of the Poor Knights Islands. All specimens are very thin walled and chalky white in appearance with only occassional splashes of colour. However, in addition a couple of specimens had numerous fine teeth on the outer lip and numerous lirations on the columella. These teeth were much finer than those found on occasional specimens of *S. pyrum* from craypots of Northern New Zealand. Also the columella lirations were very pronounced - about a dozen in number - a feature never noted on the North Cape craypot specimens. He raises the possibility of this being a new species, although given the extreme variation in the species, is loath to commit himself.

** Recent Prawn Trawlings off the Bay of Plenty and Eastern Coast of Northland have made available several specimens of the rare volute *Alcithoe lutea*. The type locality for this species is 250 miles west of New Plymouth at 275 fathoms and the holotype is 64mm in length. These specimens represent a considerable range extension, although the depth and size of shells are similiar. The main difference is in the shape of the shell, as these new specimens are considerably less bulbous than the type specimen, although they show variation in this from locality to locality. The specimen in the upper left of the photograph is very slender, has a wider protoconch, and was dredged in 600 metres of the Poor Knights Islands. When collected specimens are generally chalky white as shown in the upper right specimen (collected on the Palliser slope at 461 metres); but this can be removed with a wire brush to reveal the lovely salmon colour underneath. While most specimens are uniform salmon colour, a few specimens show broad bands of colour and axial stripes - as shown in the specimens of the bottom row of the photograph (collected from 400 - 420 metres off the Alderman Islands). This is particularly noticeable in the juvenile specimens and is also noted in *Alcithoe larochei* juveniles from the same area. The specimens illustrated range from 50 to 90mm in size, the latter being the largest known specimen for this species.

Alcithoe lutea - various localities of the East Coast, North Island (see text).

RECENT SCIENTIFIC PAPERS

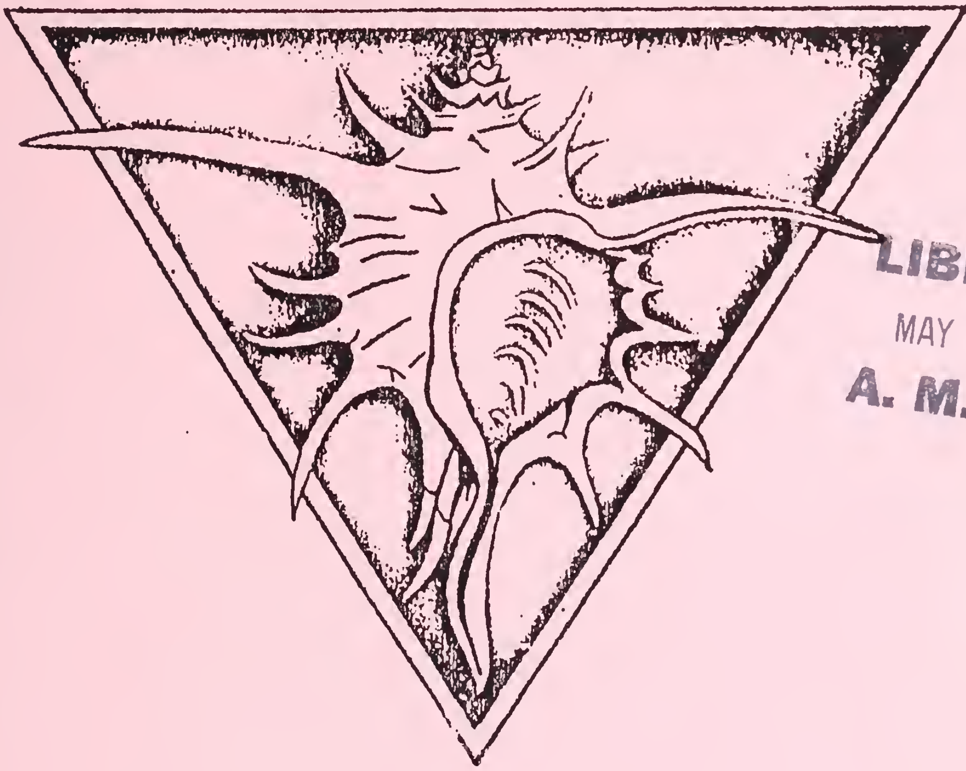
* RECENT AND TERTIARY DEEP SEA LIMPETS OF THE GENUS *Pectinodonta* (Dall) FROM NEW ZEALAND AND NEW SOUTH WALES. - B.A. MARSHALL, NATIONAL MUSEUM OF NEW ZEALAND.
N.Z. JOURN. ZOOLOGY, 1985 VOL. 12.

These deep sea limpets live in waterlogged pieces of wood that have sunk to depths below 350 metres and ingest the wood as food. Marshall desribes two new living species in N.Z. waters. *Pectinodonta auporia* is found in the Bay of Plenty off the Alderman and White Islands (This species is illustrated in Powell as *Maoricrater explorata*). *Pectinodonta morioria* is found off Timaru and differs in being smaller, thinner shelled and more crisply sculptured with rounded instead of angulate concentric ridges. In addition, a new species *P. kapalae* is described from New South Wales, and 2 new fossil species from the Miocene of New Zealand.

** SEX SELECTIVE PREDATION OF DEEP SEA, MEIOBENTHIC COPEPODS BY PECTINACEAN BIVALVES AND ITS INFLUENCE ON COPEPOD SEX RATIOS. - R.F. HICKS AND B.A. MARSHALL.

This paper was published in the N.Z. Journal of Marine and Freshwater research, 1985 vol. 19. It discusses how *Parvamussium* and *Arctinula* in the Tasman Basin and Bounty Trough contain an almost exclusive diet of male copepods and suggest this is the reason for the dominance of females in deep water assemblages.

POIRIERIA



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EDITORIAL

It is pleasing to have had a positive response to my constant pleas for articles for "Poirieria". In this issue are several short articles written by members that I hope will serve as a catalyst for still more articles! Again I am continuing the use of colour photographs for some illustrations, and I appreciate the very positive response I have had to this from many members.

Ian Scott
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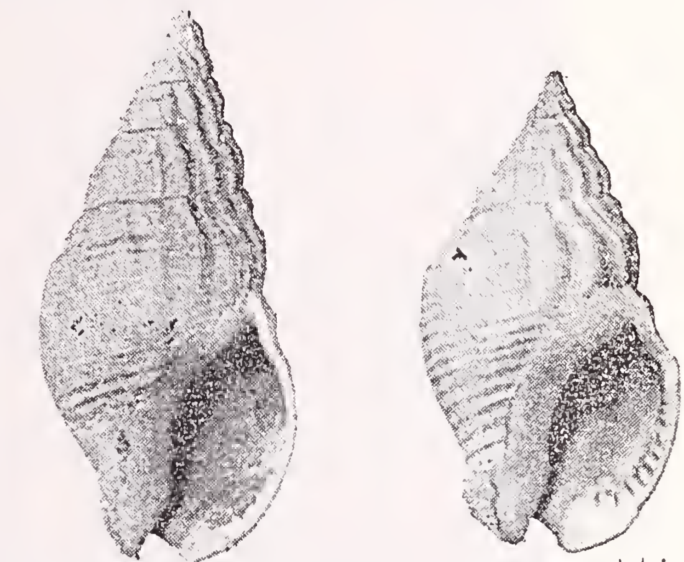
CONTENTS

The Cominella nassoides complex
by Dave Gibbs and Ian Scott

Several authors have attempted to sort out the shells in the Cominella nassoides (Reeve, 1846) complex, and as a consequence various subspecies have been proposed. FINLAY (1928) noted the occurrence of well-defined forms and proposed the name iredalei for the broad, squat Chatham Islands form; advocated the use of nodicincta (V. Martens, 1878) for the Subantarctic island forms; and noted but did not describe benthis species from off Otago Heads and Oamaru. POWELL (1933) separated off a further fossil form from the Chatham Islands based on four dead collected shells that he thought differed from iredalei from the same area. Since this is not figured in "New Zealand Mollusca" I have included his holotype here (see Figure 1). He related it to the Pliocene fossil ellisoni and called it C. ellisoni consobrina, although this was later changed by PONDER (1968) to being a subspecies of nassoides. Also POWELL (1946) proposed further names: C. nassoides foveauxana for a shorter spired, weakly sculptured form from Foveaux Strait; and C. nassoides haroldi for a small, squat form from Fiordland; and C. nassoides otakauica for FINLAY's benthic form off Otago Heads.

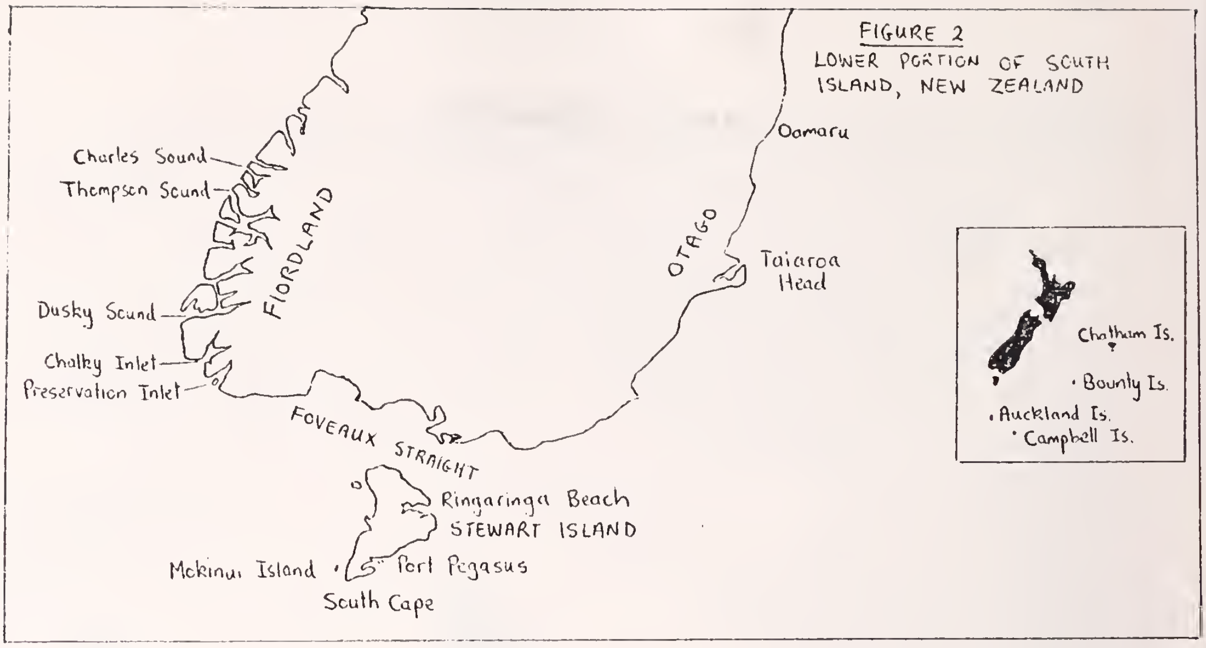
FIGURE 1



Cominella ellisoni consobrina HOLOTYPE — Cominella iredalei TOPOTYPE

The complex was reviewed by PONDER (1968) and in this paper he synonymized foveauxana with nassoides nassoides stating that "the height of the spire and the strength of the sculpture vary considerably in both shallow and deeper water populations so that foveauxana can no longer be regarded as a recognizable subspecies". He also commented on the nassoides group as follows: "A more meaningful way of showing the relationships of the nassoides group would be to regard most of the forms as either geographic or chrono-subspecies of nassoides."

In the accompanying photograph we show the extreme variation within the complex over a geographical area stretching from Charles Sound in Fiordland around to Pegasus Bay in North Canterbury. Localities for shells and geographic subspecies are shown on a map (Figure 2). We feel it is difficult to substantiate some of these supposed subspecies as there is almost continual variation from one subspecies to another. For example, the specimens from Mokinui Island the southern end of Stewart Island are an intergrade between nodicincta (restricted to Auckland and



Campbell Islands) and regular nassoides from Foveaux Strait. Similarly, as we come south from Charles Sound around to Foveaux Strait there is a gradual change from the small squat haroldi (type locality Chalky Inlet) to regular nassoides; with considerable variation at any one locality - as shown, for example, by the shallow and deep wated shells from Dusky Sound in the photograph. Going up the eastern coast to Otago the change is more sudden with otakauica seeming to be a distinctive form. However, since we have seen no specimens from between Taiaroa Head and Foveaux Strait this may explain this anomaly - either intermediate specimens from this area will come to light in the future, or else the outflow from the rivers in this region has provided a natural giographic barrier allowing for the development of otakauica as a separate subspecies. The subfossil species from the Chatham Islands, iredalei and consobrina, seem more closely related to specimens from further south than they do to the closest living species otakauica. We find it difficult to substantiate a difference between iredalei and consobrina given the extreme variability of nassoides at other localities, and given that both subspecies were found at the same locality near Owenga Beach.

In conclusion we feel that there has been too much splitting into subspecies within the nassoides complex. Other members of the Buccinidae such as Cominella quoyana and Buccinulum lineum show extreme variability both at single localities and from one locality to another, and we feel that this is a reflection of the variability of the species itself rather than being due to a proliferation of subspecies. We hope someone will explore the taxonomy of this group further and welcome a response to our article from other members.

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POWELL 1946B "New species of N.Z. Mollusca from the South Island, Stewart Island and Chatham Islands". Rec. Auckland Inst. Mus. 3(2)

VARIATION IN Cominella nassoides

TOP ROW:	First three	- Charles Sound (diver at 30m)
	Next three	- Thompson Sound (diver at 30m)
	Next two	- Dusky Sound (diver at 30m)
	Final two	-Dusky Sound (craypots at 70m)
SECOND ROW:	First two	- Preservation Inlet (Dredged)
	Next two	- Bird Island, Foveaux St. (dredged at 30m)
	Next two	- Port Pegasus, Stewart Is. (low tide)
	Final two	- Ringaringa Beach, Stewart Is. (low tide)
THIRD ROW:	First two	- South Cape, Stewart Is. (craypots at 60m)
	Middle	- Pegasus Bay, North Canterbury (dredged at 60m)
	Final two	- Off Oamaru coast (dredged at 100m)
BOTTOM ROW:	First two	- "nodicincta" Bounty Island (dredged at 80m)
	Next two	- ?"nodicincta" Mokinui Island (on bait at 100m)
	Next shell	- "iredalei" Owenga Beach, Chatham Is (subfossil)
	Final two	- "otakauica" Off Taiaroa Head (dredged at 180m)

Notes for Shell Show Exhibitors

by Noel Gardner

A Shell Show affords an excellent opportunity for collectors to display their shells for the enjoyment of other club members and the general public.

It provides an ideal learning situation and can encourage those with a latent interest in marine life to widen their knowledge and also encourage others to commence a life-long interest in this field.

Exhibitors should be allocated a similar amount of room and it is up to them to make the best use of this space.

Glass topped displays are ideal and recommended. An ideal size for a tray is approx. 2ft 6inches (75cm) by 1ft 9inches (68cm) with front edge approx. 3ins (8cm) high. The height of the back, according to the size of the shells - 3inches (8cm) to 5inches (13cm) or more.

Provision for a glass cover which can be secured in a groove or a cover held in place by clips to ensure security is recommended.

Display cases can be lined - plan colours are usually preferable, e.g. blue, green, black, according to colour of shells on display.

Colour prints, photos, graphs or drawings can be included to add interest to the exhibit, and some information regarding the display is an advantage.

Displays should be visually pleasing and not too crowded.

Labelling is most important.

Clear typed or hand written labels, which include the name, authority and area collected are essential - in a few instances the country only may have to suffice.

Sometimes one hears the comment "I don't like long clumsy names with each shell - it spoils the display." This may be so, but with judging on a points system it certainly means that the exhibitor who has gone to the trouble of ensuring his or her specimens have a full, correct identification must be given extra points - perhaps winning points.

With regard to the naming of specimens, judges often find that correct terminology has not been followed - sometimes the authority (the person who originally named the species) is not added, with the date.

Then there is confusion over whether the author's name and date should have brackets round them. Brackets are only necessary when there has been a review of that particular species and where it is now included in a different genus, etc. to that in which it was placed in the original description.

Recourse to most good shell books, however, would provide this information

Judging is usually based on a points system, decided by the organizing committee.

For example:-

Quality of specimens	40 points
Presentation and apparent amount of work	20 points
Accuracy of labelling	20 points
Variety of species or families	20 points

A CLOSER LOOK AT *Muricopsis octogonus* - by IAN SCOTT

It has long been known that *Muricopsis octogonus* is a very variable species in terms of shell sculpture, particularly in the degree of development of spinose processes. Both PONDER (1968) and POWELL (1979) refer to the fact that most deeper water shells have long spines whereas shallow water or littoral shells tend to have shorter and more numerous spines. FINLAY (1927) separated off these deeper water shells as *M. cuvierensis*. His type specimen is shown in Figure 1 and is a small 15mm shell collected alive at 40 fathoms off Cuvier Island. His comments on this shell were "superficially very close to *M. octogonus*, but separable at sight by the character of the interstitial ornament... and sharp projecting spines at summit of axials, relatively much more prominent than in any specimen of *octogonus* I have seen." He elaborated on the interstitial ornament as follows: "In *cuvierensis*, the interstitial riblets are numerous and minute, quite inconspicuous: this is most strikingly seen in the space between the last basal chord and the two on the canal (there are here two to three prominent spiny cords in *octogonus*) and on the shoulder, where there is no trace of stronger cords." PONDER (1968) synonymized *cuvierensis* with *octogonus* claiming that in a large series of specimens *cuvierensis* could not be satisfactorily distinguished, and POWELL (1979) agreed with this. I would also support this viewpoint.

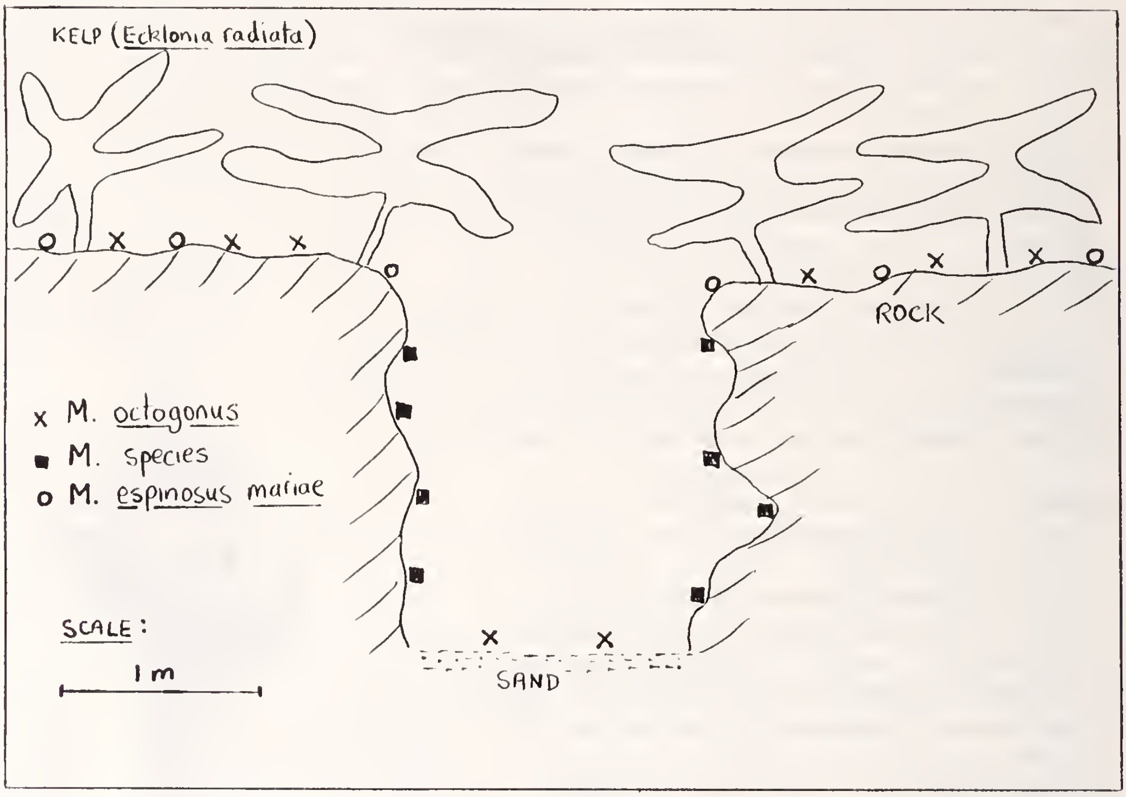
Figure 1 : HOLOTYPE *M. cuvierensis* (x4)

However, over the last several years I have come to the conclusion that there are two species of *Muricopsis* in the *octogonus* complex, although in a different way from what FINLAY thought. My conclusions are based on examining a large number of specimens from a small area off Cape Rodney. Here the substratum is rock with several sand channels penetrating into the rock; is at a depth of 12 to 15m; and is dominated by the algae *Ecklonia radiata*. The two photographs show the variation in *Muricopsis* collected from this area. In the first photograph are two rows of *M. octogonus* showing the variation in colour and spinal development at this locality. Most specimens are heavily encrusted with coralline growths and the spire is often eroded. Below these is a row showing *Muricopsis espinosus mariae* and *Buccinulum mariae* from this same locality for comparison. While mature specimens are easy to distinguish, juveniles of *M. octogonus* can at times be difficult to separate from *M. espinosus mariae*. However, there is no doubting that both species are present. *Buccinulum mariae* is most easily separated in live specimens by its pale straw coloured operculum.

In the second photograph are a group of shells which are consistent in shell sculpture, yet quite different from the *M. octogonus* in the first photograph. These shells come from the same locality, at the same depth as all the shells figured in the first photograph. They are typically found on the vertical walls of the sand channels: an area in which encrusting sponges and brachiopods are the dominant marine

life. M. octogonus are typically found on the flat rocky surfaces above these sand channels, but are also sometimes found on the sand itself.

This is illustrated in the following diagram:



These shells tend to be larger on average than M. octogonus with the two largest specimens found shown in the photograph. Their sculpture is consistently different. The cords typically alternate between a large one and a small one; whereas in M. octogonus the cords are all the same size with some irregular interstitial cords on the shoulder or near the siphonal canal only. This feature is consistent on all specimens seen and is clearly visible in the photograph. Furthermore, these cords when examined more closely consist of small triangular spines which project at the varices. However, they are always open; wheras in M. octogonus they may close completely to form hollow spines on the varices. Thirdly, the colour of these shells is invariably paler than M. octogonus from the same area. Finally, the operculum is always a pale brown rather than the dark chocolate brown of M. octogonus.

At Cape Rodney there has never been a problem separating these shells in the hundred or more specimens examined. They are found on the Eastern side of the North Island as far south as Mahia Peninsula, typically in areas where the main sand substratum is at a depth of 20m or more. I have seen them from White Island, Mercury Bay, Mokóhinau Islands and from the Poor Knights. On offshore islands they tend to be higher spired more elongate shells, but the sculpture is still the same. I have seen one specimen feeding on a brachiopod, and they are often found amongst brachiopods. In fact they often have brachiopods attached to their spire.

In conclusion, while I cannot propose a new species name here, I feel confident that there is a new species and that it is not the cuvierensis named by FINLAY. Its habitat in

channels or under rock ledges would explain why it did not appear in earlier dredge hauls, and it is only the advent of SCUBA diving shich has made specimens available. I look forward to further discussion on this shell.

TOP TWO ROWS: Muricopsis octogonus
BOTTOM ROW: Left side Muricopsis espinosus mariae
Right side Buccinulum mariae

BOTH ROWS: Muricopsis species

A NEW MOLLUSC _ WITH AN INTERESTING DIET.

Nancy Smith.

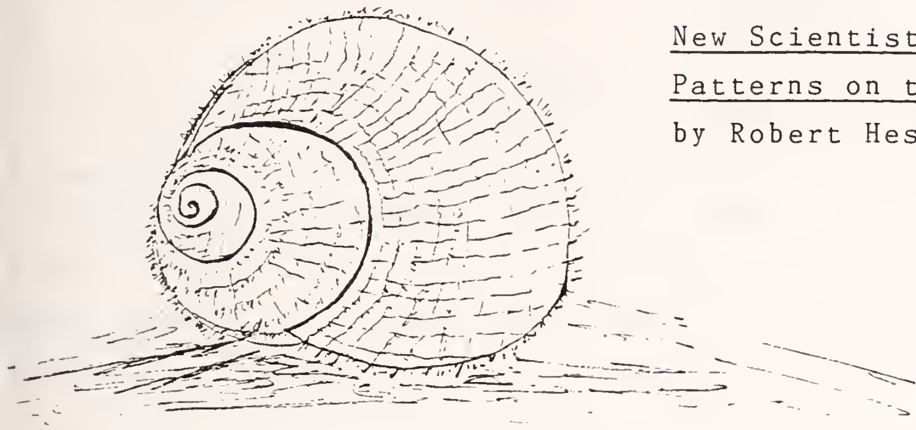
In the abyssal depths where sunlight never reaches there is little life because there can be no photosynthesis. to start a food chain. But all the oceans are rifted along ridges where volcanic activity takes place and here and there hydrothermal vents spew warm mineral-laden water into the cold ocean.In these slightly warmer areas scientists have found strange chemoautotrophic bacteria which can oxidise the abundant sulpher compounds to give them their energy and substance. These organisms start a food chain of creatures which live clustered round the hydrothermal vents.

Among the vent communities, living off the primary product of the sulpher bacteria are limpets and bivalves sea anemones and tube worms, shrimps and crabs; some ingesting the bacteria, some predating or scavenging off others. Giant tubeworms and bivalve molluscs have a symbiotic relationship with the sulpher bacteria. The clam Calyptogena magnifica appears to rely entirely on the autotrophs which live in its gills, whereas the mussel Bathymodiolus thermophilus has the symbionts in its gills but also filter feeds on bacteria and other matter in the water.

In 1987 scientists from the Scripps Institute of Oceanography at La Jolla, California, using the submersible Alvin visited some hydrothermal vents in the Mariana trough and here were surprised to find a gastropod harbouring the sulpher bacteria. This as yet unnamed mollusc looks much like a garden snail (Helix aspersa) wearing a hairy coat very like that of a Monoplex parthenopeus. Its enormous gills contain especially modified cells which are packed with the sulpher bacteria. Biochemical tests showed high levels of enzymes typical of sulpher metabolism. But the "hairy snail" also has a well developed radula which could scrape bacteria from the rocks around the vents and it is not yet known how dependent the snail is upon the bacteria.

It is ten years since the discovery of biological communities round hydrothermal vents in the ocean depths. Symbioses with chemoautotrophic bacteria was first found in clams from hot vent areas, then from other bivalves and other sulpher-rich areas. Now it is known in a gastropod. Further studies will teach us much about the deep sea floor and may help to explain the lifeforms that live in sewage outfalls and mangrove swamps.

Reference:
New Scientist 24.3.88.
Patterns on the Ocean Floor
by Robert Hessler et al.



THE CONCHOLOGY LIBRARY

There is a library in our Conchology Section and it needs to be used.

It comprises about 350 books on shells and include encyclopedias and compendiums on world-wide shells, shells of a particular area, books on a particular family and lists of shell dealers. Many of these have been donated to the library and some date from the 1930s, but the Committee endeavours to buy most new books as they are published, particularly if they are good reference books which may be too expensive for most shell collectors to buy for themselves.

We subscribe to several shell periodicals and exchange our "Poirieria" for publications from other shell clubs, so have a range of these from various parts of the world. They include such publications as The Conchologists Newsletter (Britain), Arion (Belgium) in French with some English, Hawaiian Shell News, Journal of the Malacological Society of Australia, and our own Tane, which gives good articles occasionally on shelling areas around New Zealand and these are subject indexed. Some periodicals sent to us are in foreign languages and these we pass on to the Museum Library, but the majority we keep on file in our own library where they are available on loan.

We also receive a number of scientific papers relating to molluscs each year. These are catalogued and subject indexed and put into binders according to subject matter. These too are available on loan and are a good source of material on a particular family, genus or single species, locally or from overseas, and a few articles on landsnails and fossils.

A very few books are set aside for reference only and are not allowed out of the library, but are available for reference on Club nights.

The library started as a donation of books by Mr and Mrs Hipwell and occupied a couple of shelves outside Dr Powell's office. Mavis Holloway became the first Librarian in 1940 until the Conchology Section went into recess during the war years. It started again in 1945 with Keith Wise as librarian, after which came a succession of people: Norm Gardner 1947-1952, Ted Mulligan 1952-1957, Pat Bond 1958 and N.I.Jackson 1959-1960. In 1953 the Club, formed by Baden Powell in 1930, became a Section of the Auckland Institute and Museum which gave it international status. In 1959 the Museum authorities assigned to the Club its own club room which enabled it to house its own shell collection and library. Alma Morgan was librarian in 1961 for two years and following her came Mark **Tapply** 1963-1968. Jock Walker in 1969 was responsible for re-organizing the library, and Jim Goulstone took over

in 1971 and bound many of the scientific papers into volumes. Rae Stanton was librarian 1975-1976 and myself from 1977.

A quotation from the special issue of "Poirieria" published on the Club's 50th Anniversary in 1980 pays tribute to our early librarians without whom we would not now have this asset. It reads:

"The Club is very fortunate in its possession of an extensive library of technical and general books and papers covering every aspect of our hobby. Many of these have been given to the Club or purchased with funds derived from the sale of gifts of shells. A good library is essential to any serious student of conchology, and those of our junior members who are studying subjects connected with aspects of marine biology are particularly fortunate in having this reference material so readily available. We owe a particular debt of gratitude to our librarians, who have served the Club so well by cataloguing the books, etc and maintaining them in good repair."

Rae Sneddon

VISIBLE EVIDENCE

by Margaret Morley

This drawing is the first of a series. I plan to choose species which are not illustrated in the 1979 edition of "New Zealand Mollusca" by A.W.B. Powell.

It is often difficult to identify a shell correctly from a description only, especially when comparisons are made with other species in the family which you do not have.

Aclis pseudopareora Powell, 1940
Date found: 1 February, 1984
Place: Shell sand, Oneroa, Waiheke Island
Height 3.2mm; diameter 1.0mm.

The following description is from Dr Powell's paper.

1. Epitoniidae

2. Genus Aclis Loven, 1846

Shell small elongately turreted, spinally keeled, glossy, pale buff. Whorls 7, including a blunt smooth protoconch of two convex whorls. Spire about 3½ times height of aperture. Slightly more than upper third of each opire whorl occupied by a straight steeply-descending shoulder, as in Poreora. First post-nuclear whorl with two sharply raised spiral cords, second whorl with an incipient third keel, third whorl with three keels, fourth and body whorl with four keels. A fifth weaker spiral is situated just below the aperture, but the rest of the base is smooth. Aperture ovate. Peristome thin, discontinuous. Pillar arcuate, slightly reflexed over a narrow crescentic umbilical cavity.

Height, 3.15 mm; diameter 1.15 mm. (holotype)

Localities: 6-10 fathoms off Mangonui, Doubtless Bay (holotype);
6-10 fathoms off West Coast of Great Barrier Island.

The specimen shown was found in shell sand from Oneroa, Waiheke Island, on 1.2.84 - height 3.2 mm; diameter 1.0 mm.

Contributions are invited to this series.

If you can bear to part (temporarily!) with the specimen, but feel unable to draw it, I will do so.

References

1. "The Marine Mollusca of the Aupourian Provence, New Zealand" Trans. Roy. Sec. Auckland Museum 70(3) P.236.

2. "New Zealand Mollusca" A.W.B. Powell, 1979. P.136.

Acknowledgements

Many thanks to Norman Gardner who identified this shell.

TE NGUTU O TE MANU

by J.F. Goulstone

My wife and I visited friends in Hawera recently who were particularly knowledgeable about the history of South Taranaki. When I asked them the whereabouts of any local bush which could contain native snails they told me of the above Reserve, a piece of bush with a violent but colourful history. We then planned our return home to look at this old Maori Pa site.

The site proved to be somewhat disappointing for a snail collector at first sight, for it consisted of a large well mown area of grass, dead flat, with only a narrow band of trees completely encircling it. The trees though very large and predominantly Tawa, also contained many introduced species. However, upon walking over the grass, past a small monument, around a track under the encircling trees, which partly followed a small stream, I found the special atmosphere and beauty of the place gradually enfold me.

The last Maori leader to use the Pa, the wily Titokawaru, had used the very lack of feature of the land, as well as the thick bush as his defence. Several large parties of British soldiers sent to arrest him had been confused, ambushed and routed by very much smaller numbers of Maoris. In the last encounter the renowned adventurer, artist and very brave soldier Ferdinand von Tempsky was killed.

But the good news on the snail front was that a few native snails still survived alongside the small stream and under the large Tawas, descendants no doubt of the very species that had been crunched under-foot at the height of the battles. Not many though and nearly overwhelmed by the introduced hordes. Here is a list of the brave defenders.

Cavellia buccinella (Reeve), Phenacharopa pseudanguicula (Iredale), Phenacohelix giveni (Cumber), Flammulina perdita (Hutton), Laoma marina (Hutton), Laoma mariae (Gray), Punctid erigone (Gray). (This is the fartherest south record for this species I think). Punctid ariel (Hutton), Punctid n. sp. 29.

And the invading hordes, in astronomical numbers, Oxychilus allarius (Miller), Cochlicopa lubrica (Muller)

The road outside the Reserve bears the name Tempsky and one day I will return with my tent and spend a few days reliving the past in what is now a very tranquil haven.

NOTES ON SOME BUCCINULUM FROM FIORDLAND

by Dave Gibbs

Over the past 8 years I have amassed a large collection of New Zealand Buccinulums and have spent many hours pondering over identification of the various species. Most of the North Island species are "fairly distinctive", however subtidal specimens tend to vary considerably in both colour pattern and sculpture, particularly Buccinulum linea from the off-shore islands of the Hauraki Gulf (see photo in "Poirieria" Vol.15, No.5).

In 1987, I went on a diving/shell collecting expedition to Fiordland, diving in most of the sounds from Milford to Dusky, finding many new and interesting specimens fro my collection. Unlike northern waters, Buccinulums were very scarce: from a total of 30 dives I collected only about 15 specimens; 10 of these from one locality. Probably the habitat was unsutable, as many of the places we dived were on vertical rock walls with the bottom far out of safe diving range, with only black coral trees and the odd ledge and crevice suitable for shells.

Deep Cove, at the head of Doubtful Sound was the exception, as here, large rocks dumped in the cove during construction of the Manapouri power station tailrace make for an excellent habitat for shells. While diving there, I found 10 specimens of a Buccinulum sp. I was not familiar with. (See photo). It has been suggested to me by a few very experienced collectors that these represent a possible new species. I first assumed these shells were the marwicki form of Buccinulum pertinax. However, I have since discarded this theory after reading Finlay's paper. These Fiordland shells are all very narrow; tall spired; have numerous axials on early whorls, becoming obsolete on the penultimate whorl; have spiral cords moderate to weak; and have a colour pattern ranging from orange through to dark chocolate. The closest other species I can associate them with is Buccinulum pertinax finlayi (Powell), which brings me to the second series from the Fiordland area.

Only 4 specimens of these were found, one each from Thompson and Bradshaw Sounds, and two from Dusky Sound in the vicinity of Resolution Island. (See photo). This series very much resembles finlayi, particularly the benthicola form which has strong axials on all whorls; whereas in typical finlayi, these axials are obsolete on the body whorl. The piral cords on this second series are very strong, numbering 12-15 per whorl, and on 3 specimens a faint trace of brown colour shows on the cords. During my research for this article, I examined many specimens of Buccinulum finlayi in several private collections and I noted a large variation in sculpture. I now believe that these shells must be Buccinulum pertinax finlayi, which is an extension of their east coast range. In addition they are living in much shallower water.

As for the first mentioned shells, these could be a further extension of finlayi, being merely a colour variation, or perhps as suggested earlier - they could be a new species.

Acknowledgements

Thanks to Mr & Mrs N. Gardner, Mr J.R. Penniket and Mr & Mrs R. Grange, for the opportunity to examine specimens in their collections, and to Mrs R. Jenkins of Invercargill for obtaining specimens for me.

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Finlay, H.J. 1928: "The recent mollusca of Chatham Islands" - Trans. Proc. N.Z. Inst. 59 232-286

Powell, A.W.B. 1929: "The recent and tertiary species of the genus Buccinulum in New Zealand" Trans. proc. N.Z. Inst. 60 57-101

Dell, R.K. 1951 A "Deep water molluscan fauna from off Banks Peninsula" Rec. Cant. Mus. 6 (1) 53-60

Ponder, W.F. 1971C "A review of the New Zealand recent and fossil species of Buccinulum" Journal Royal Soc. N.Z. 1 (3-4) 231-283

TOP: ROW:	Left	- B. finlayi, off Taiaroa Head (trawled, 200m)
	Middle	- B. finlayi, off Oamaru (trawled, 100m)
	Right	- B. finlayi, off Taiaroa Head (trawled, 70m)
MIDDLE: ROW:	Left	- B. species, Deep Cove, Doubtful Sound (diver, 20m)
	Right	- B. species, Dusky to Thompson Sound (diver, 20m)
BOTTOM ROW:	Left	- B. pertinax, Golden Bay, Stewart Is. (low tide)
	Middle	- B. pertinax, Horseshoe Bay, Stewart Is. (low tide)
	Right	- B. pertinax, Perseverance H., Campbell Is. (low tide)

THE LEGEND OF THE BIG BOY

by Helen Stewart

It was on a tramping club trip to Mayor Is, that I first saw the big elephant seal who was later to be named Humphrey. This incident happened some four years ago in August. You conchologists may wonder why this article on a mammal, appears in a shell club journal. Well, the very large seal was lying on a beach on the Mayor, and under his nose was a small but very beautiful paper nautilus (Argonauta nodosa). I really wanted that shell, but how to acquire it without becoming a meal for a hungry seal was the question. Along came a fearless friend who nonchalantly went quietly up to the sleepy giant - and presented me with the shell.

After this incident, the seal decided to call into all the resorts on this coast, including in his itinerary, Opoutere, Pauanui and Whangamata. He received mixed receptions from most resorts, including a drubbing one night at Whangamata, by a gang of louts armed with sharpened stakes. This led to local Wildlife Rangers and helpers furnishing him protection from over exuberant fans. Story followed story as the seal built up a legend. There was the one about him preventing some ardent whitebait catchers from reaching the best places for these luscious fish up the Wentworth - he thought so, too! Then there were the golfers who daren't hit their

golf balls onto a certain green - Humphrey was nonchalantly reclining on it. It was about this time he first evinced his desire for a mate, (it was the mating season on Campbell Is. where he had been a pup) but somehow or other he had become disorientated, so his next essay was up the Otahu River where he serenaded Richardson's cows. His roars could be heard in the town when the wind was right, but on this occasion there was no damage done to farmer's fences or troughs. Another story involved a family who thought to wade over the Otahu River to see him but he had other ideas and came posthaste to meet THEM, causing a somewhat hasty retreat. The dog story which went the rounds was that he had bitten a poodle. I was asked by anxious dog owners if it was true - and neither confirmed nor denied. You should have seen the rush to leash their roaming pets. Stories from other resorts came thick and fast, so two people in Whangamata, a wharf warden and I decided to at last give him a name. We asked the school children to submit names for him with a book token as a prize - I can't remember how many names were submitted, but Bert and I both (unknown to the other) chose the name Humphrey, as suitable and dignified for, by this time, our big friend. As Humphrey he has become known all over the world, and although still remaining a wild animal - he can turn with remarkable celerity - he has found a niche in the hearts of residents of the whole area as far as Whiritoa and Pauanui. I used to walk along the beach on a beach patrol - shells and bird 'wrecks', and stop for a quiet talk quite close to him. But I never presumed to touch him or in any way marr his dignity. Most of my photos show a sleeping giant.

So the years and the stories go on, but it was in August of 1987 that Humphrey hit the big time TV. His desire for a mate must have driven him to those destructive movements on an Opoutere farm. I did not have much to do with this project except that the farmer's wife had contacted me in desperation. She said he had broken fences and pipes, and was even following the cows to the cowshed. I suggested, facetiously, to let him have his way with a cow. The resultant calf may provide fish tasting milk! Not unexpectedly she was not amused, so I suggested she ring the Conservator of the Thames branch of the Department of Conservation, Toko Te Aho. So the Department swung into action. Unfortunately, to my dismay the media found out, and then began the Humphrey hysteria, which has gone on ever since. I feel the animal received extreme stress, but what can one do in the face of the powerful media. No wonder I gave up the game. I suppose the whole affair attracted tourists, but the stress caused to both farmer and the mammal was hardly fair. Finally, an elephant electric fence was used to give him a jolt which has caused him to treat that farm with respect.

In 1988 he went up a drain onto another farm for 1½ months, as he is welcome there and his presence was kept really low key until he decided to pay a visit to Whangamata where he spent most of his time lounging near the wharf. It was at this time too that a few of us decided to resurrect the group of Wildlife Guards and a Wildlife Fund which is used for any wildlife at risk or otherwise. The Guards will take stints if and when Humphrey returns, and a notice with suitable words will be erected wherever he deigns to take his rest. Any other mammal beaching themselves will receive the same attention. A leopard seal received similar care last year.

Because of the doubt that Humphrey is not the same animal who visits each year, the Department decided to tag him. I have never had any doubts. He has been moulting and during that time he does not feed much, causing a certain wrinkling of his skin. The Department brought Dr Crawthorne, a zoologist from Wellington, to do the dirty deed. Dr Cawthorne explained to me that tagging of these mammals is also carried out in Australia, the idea being to track the movements of the seals over the Pacific, because their numbers are dwindling. He also told me that he had tugged hundreds

of these animals at Campbell Island where they breed. He had no idea why Humphrey returned here year after year instead of returning to his breeding grounds. Possibly he is a batchelor who is no longer able to hold his own among the younger bulls. The doctor stated that Humphrey was about 20, but as they rarely live beyond the age of 30 ish, he is a middle-aged seal.

On tagging day, Humphrey regaled himself with a snack of five John Dory, caught with elan near the wharf. He actually showed us each one. Once again - by some means - the TV crew had received wind of the tagging. This operation was apparently flashed around the world - flashed, is the operative word! The following day he retired to Otahu to feed, and nurse his sore tail, and was treated to a display of Humphrey mania - even to a visitor touching his understandably tender tail. He made off with speed and has not been seen since.

Here are a few pertinent facts on these enormous seals. They breed in both the Northern and Southern hemispheres (Campbell Is.) and can reach the length of 6m and the weight of 3 tonnes, according to Jacques Cousteau. Again from the same source is the fact that they mainly live off squid and octopus, and dive to depths of 1000 ft in order to catch these deep water sea creatures, sometimes surfacing a mile away in very short time. The fact that they only make the age of thirty, has an explanation for their life style. Fighting among the bulls for their harems and the efforts of breeding for such large animals make them very tired (the gestation period for elephant seal cows is 350 days) - hence the amount of sleep Humphrey requires without interference. Of course he does not have to fight now. The question is, will he come back this August? Only the big boy can decide this, so let us review the way in which we are to treat him. Already his image is perpetuated in pet stones, concrete and even inflatable plastic, not to mention a children's book. Let us all realise he is still a wild animal to be treated as such. In the meantime I, and my group of 20 odd Wildlife Guards, hold ourselves in readiness.

ITEMS OF INTEREST

- *Haliotis iris* on Chatham Island were three deep on the underside of rocks in water on 30-40 cm deep. When the rocks were turned the pauas immediately became active and moved surprisingly quickly out of the air and light. On one occasion a H. *iris* about 10 cm long was observed being attacked by a *Cominella maculosa*. The Cominella was slowly thrusting its foot underneath the paua which was twisting and turning in all directions but had no chance of escaping.

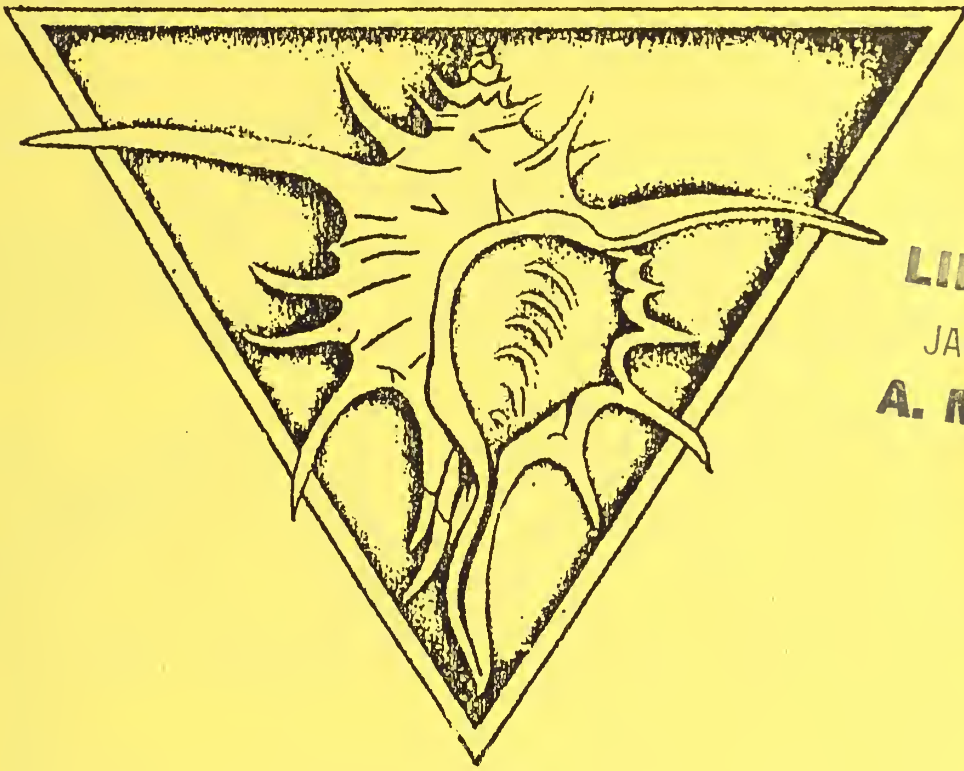
  (Rae Sneddon)

- Powell mentions *Paryphanta busbyi busbyi* as coming from Awanui in the north to Woodcocks (near Warkworth) in the south; with an isolated colony near Awhitu Central (South of the Manukau Harbour) that was introduced by man. While walking along the beach at Little Huia earlier this year I was surprised to find numerous freshly dead shells of this species. In all I found more than thirty specimens in the space of ten minutes. Apparently these were washed down from the stream nearby. On mentioning this to older club members, I discovered that this too is a man introduced colony, and evidently it is thriving.

  (Ian Scott)

- An here is another range extension. In "New Zealand Mollusca", Powell gives the range for Cominella virgata virgata as "North Island; Whangarei to East Cape". Margaret Morley has now extended this range to Tasman Bay. She writes: "On 26th November, 1988 I found one mature specimen of this species alive on low tidal rocks at Torrent Bay in Tasman Bay. On 3rd December, 1988 I found two juvenile specimens, one alive and one hermit crabbed, at Tata Beach in Golden Bay". She asks if anyone else can corroborate these findings.

POIRIERIA



Auckland Museum
Conchology Section

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EDITORIAL:

The creation of marine reserves around the New Zealand coast has been an obvious success judging by their popularity with divers and marine scientists. In a matter of just a few years fish and rock lobster stocks have built up to levels where they are now abundant. Thus divers can now view six or more rock lobsters competing for space under a rock ledge or hand feed large snapper and blue cod. The question I am asking is does this have any effect on populations of molluscs?

My personal impression from diving inside and outside the Leigh Marine Reserve is that there is little or no difference. Thus shell species found inside the reserve are equally common at Matheson Bay outside the reserve. At the Poor Knights Marine Reserve shells are few and far between, and I have often wondered whether this is due to increased predation from the enhanced fish stocks - any diver who has turned over a rock and seen it swept clean in seconds by foraging parrot fish will know what I mean!

At present proposals are being put forward to turn 10% of our coastland into marine reserves, and if this goes ahead it would severely restrict where we could collect shells. An alternative would be to allow shell collecting within such reserves; especially if it can be shown that this has little effect on shell populations. There is already a precedent for this in that certain types of fish may be caught at the Poor Knights on floating lines. I feel that this matter should be discussed by members and some sort of consensus arrived at so that we can lobby as a group for what we want to happen.

Ian Scott
25 Halston Road
AUCKLAND 4

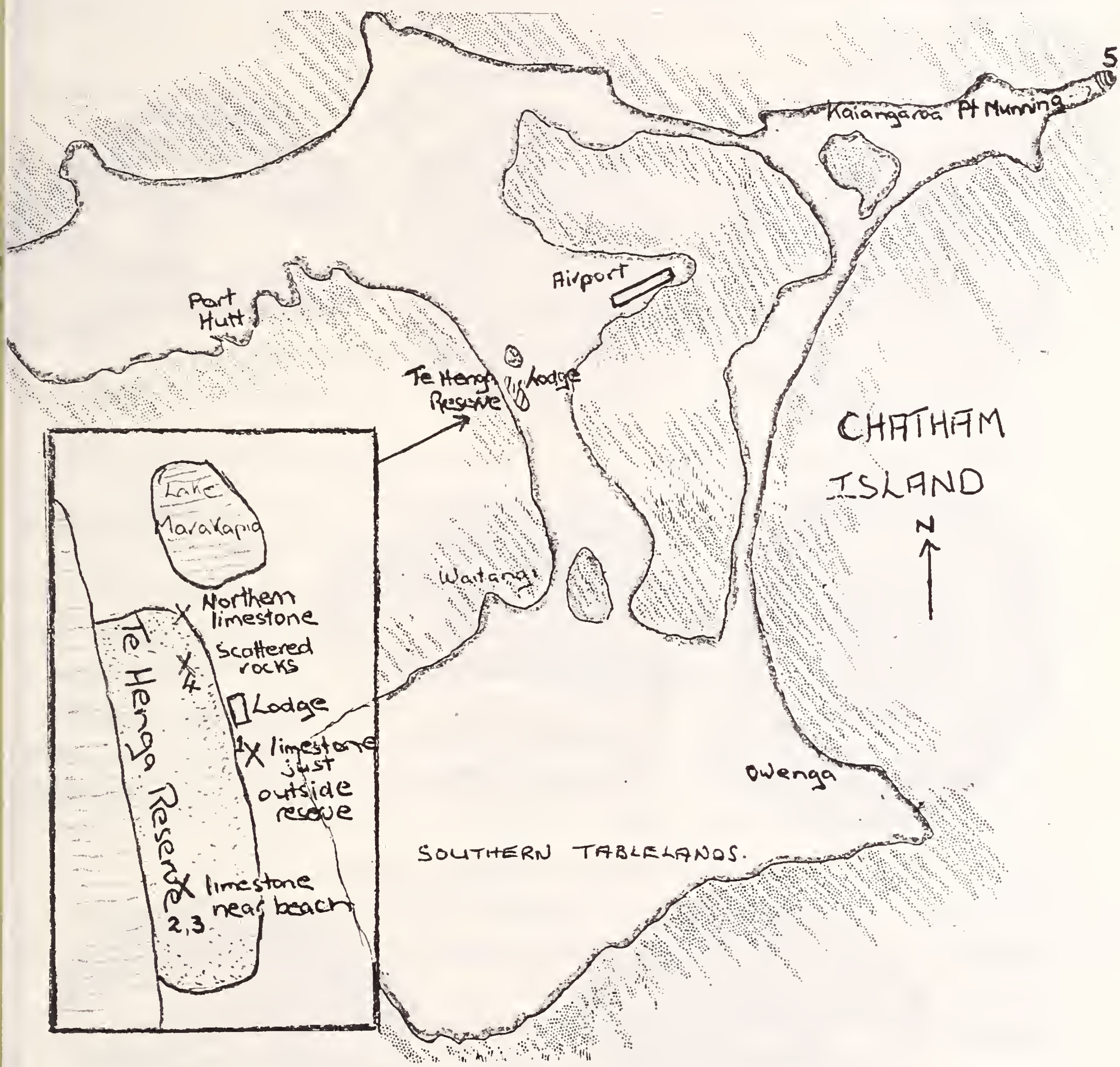
CONTENTS

CHAROPA COMA (Gray) IN THE CHATHAM ISLANDS.

J.F.Goulstone.

The February Shell Club trip, of which I was a member, stayed adjacent to the airport at a magnificent Lodge sheltered on the seaward side by Te Henga Reserve , an extensive piece of bush presented to the Crown by our hosts the Sutherlands.

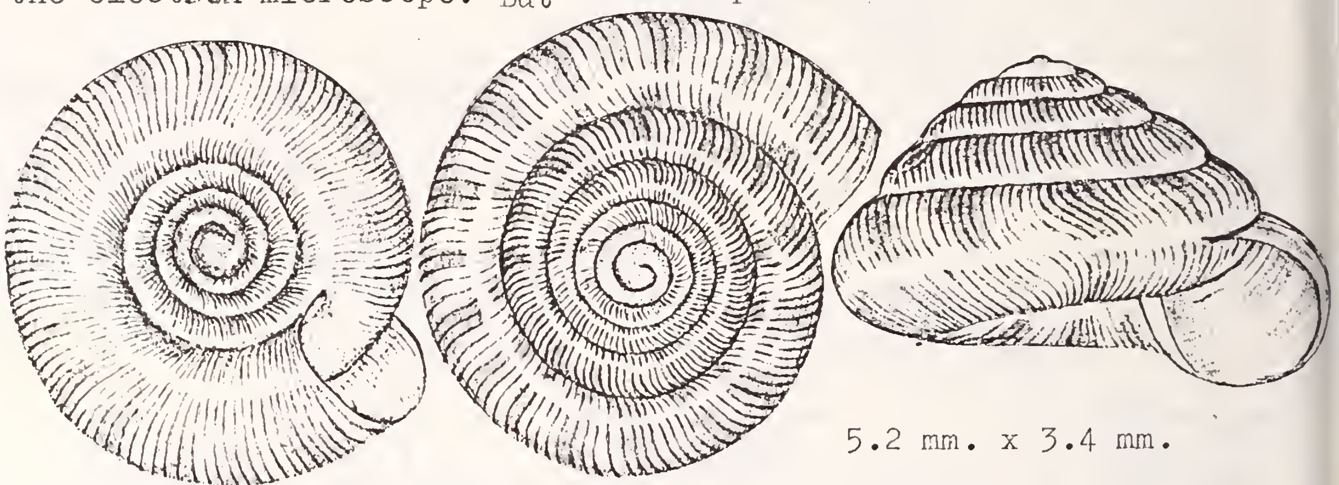
I found snail collecting quite hard going for a number of reasons not the least being the great difficulty in travelling to the widespread Reserves. In the event I covered the northern part of the island quite well but hardly touched the southern tablelands and



cliffs where the best remnants of bush are preserved. However, in the sites and Reserves I did sample, Te Henga turned out to be by far the best and it was here I discovered <u>Charopa coma</u> (Gray 1843). This species has not previously been collected in the Chathams though Dr.

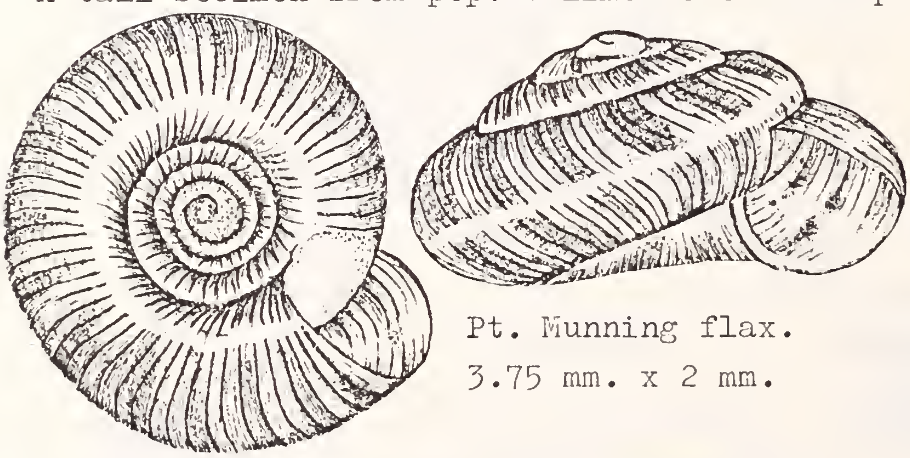
Climo told me he has seen fossil specimens amongst midden material collected by R. Wallace. I also collected two specimens from the extensive flax in the far northeast at Pt. Munning.

The Island was very dry and I collected no live specimens. As Charopa coma is a prominent species in New Zealand on the three islar and moreover varies quite a bit from north to south, the Chatham find was very interesting. After measuring up and counting ribs on these shells and comparing them with New Zealand Charopa coma , some of mine and some of Norman Gardners, I formed an opinion that probably these Chatham ones were a separate species. As was done with Charopa pseudocoma (Suter) this will be revealed one way or the other with the electron microscope. But for the present record it seems suffic-



5.2 mm. x 3.4 mm.

A tall secimen from pop. 1 limestone outcrop Chatham Is. Lodge



Pt. Munning flax.
3.75 mm. x 2 mm.

globosa Days Bay Wellington H.E.Whitten 1956 for comparison of shape.

ient to consider it as a form of Charopa coma.

Te Henga snails I found in several populations all alongside limestone outcrops. The Pt. Munning snails I found at the base of flax by peeling back dead leaves.

Population 1 One hundred metres from the Lodge in limestone rocks quite sheltered and shaded by trees but outside the Reser and exposed to animals. I think this lot will have a rather limited life. I collected 18 good adult shells 12 damaged and 26 juveniles. The 18 ranged in size from 4 mm. to 5.8 mm.and had the following

characteristics -

no.	R.I.	H.I.	U.I.	Pro. Wh.	Tot. Wh.	P.N.W.
18	16.8	1.69	2.9	1.9	5.5	31.7

no = the number of species processed and averaged
R.I. = the total number of ribs on the final whorl divided by the greatest width.
H.I. = the greatest width divided by the height.
U.I. = the greatest width divided by the width of the umbilicus.
Pro. Wh. = protoconch whorls averaged.
Tot. Wh. = total number of whorls averaged.
P.N.W.= total number of ribs on the post nuclear whorl , the one immediately following the protoconch.

Population 2 was at the southern limestone outcrop overlooking the beach but in the Reserve. This lot I collected on the spot in the ledges and holes of the rock. I obtained 18 good adult specimens from 3.4 mm. to 5 mm. 7 broken and 4 juveniles.

no.	R.I.	H.I.	U.I.	Pro. Wh.	Tot. Wh.	P.N.W.
18	19.8	1.64	2.8	2	5.4	33

Population 3 was taken at the previous site but from litter on the ground amongst the rocks. I obtained 17 good adult shells 3.75 mm. to 4.5 mm. , 12 broken and 22 juveniles.

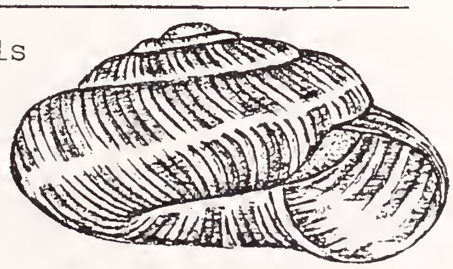
no.	R.I.	H.I.	U.I.	Pro. Wh.	Tot. Wh.	P.N.W.
17	20.1	1.71	2.8	1.9	5.1	32.4

Population 4 . These were several juveniles taken at the base of some large but scattered rocks toward the northern end of the Reserve not far from the Lodge. The ground was fairly open and grassy here though the rocks were shaded and covered with growth. A more concentrated limestone outcrop not far away at the extreme northern boundary, though it contained many snails , had no *Charopa coma* . I didn't measure these juveniles

Population 5 in the flax at Pt Munning. 1 good adult 1 broken.

no.	R.I.	H.I.	U.I.	Pro. Wh.	Tot. Wh.	P.N.W.
1	16	1.9	2.9	1.25	4.5	23

5.5 whorls
4.5 mm.
x
2.5mm



4.25 whorls
3.4 mm.
x
2 mm.

Two variations from population 2.

Apart from the limestone outcrops the snails in the rest of the bush

at Te Henga were very scarce but not altogether absent. By choosing the densest portions and putting in a lot of work the odd snail could be found, usually Mocella eta (Pfeiffer), though I never found Charopa coma this way.

Although all the above indices are within the ranges of the New Zealand snails, the shape of the globose Wellington form is very different from the tall Chathams one. The Chatham specimens also have a lighter smaller rib and a less prominent radial, brown colour marking. However, an important aspect of these shells is the great range of rib spacing and shell height within the one colony. The rib indices range between 12 and 24, the height indice between 1.5 and 2.1. Where a somewhat similar circumstance occurs in the North Islan south of Dannevirke, Cumber surmises that two sub-populations long separated, have recombined to produce a bimodal effect. Stangely, th globose North Island shells have wider ribbing than the flat ones but the tall Chatham shells have the finer ribbing and the flat ones the coarse. Quite a few flat ones do have fine ribs though.

I hesitate to offer an explanation for this variety but note tha another species occupying the same space in huge numbers exhibits als an unusual range of shell heights. This is Punctid rakiura (Dell) a small plain light brown shell without ribbing..

References, relating to N.Z. variations
Henry Suter, Manual of the N.Z, Mollusca, 1913, pp. 705 - 707
H.E.Whitten, Conch. Sect. Auck. Mus. Bull. 12 1956
R.A.Cumber, Trans. Roy. Soc. Vol. 1 no. 30 1962 pp. 365 - 370.
F.M.Climo, Rec. of Dom. Mus. Vol.6 no. 18 1970 pp. 294 - 296.
Other literature, looked at,
Hutton, Manual of N.Z. Mollusca 1880 p 8.
A.W.B.Powell N.Z. Mollusca 1979 p. 303, Shellfish of N.Z. 1937.
N.W. Gardner, Poirieria Vol. 8 Pt. 4 1976 pp.63- 65
F.M. Climo Nat. Mus. Rec. Vol. 2 no. 14 1983 p157 separating pseudoco

Acknowledgements Dr. F.M. Climo has looked at some of the specimens and given me some helpful information.
Pauline Mayhill sent me a list of species she collected in 1982 which was mighty helpful and contained many more than I saw but not C. coma
Norman Gardner showed me his C. comas from the lower North Is.
Bruce Hazlewood contributed stimulating comment.
John and Denise Sutherland provided outstanding hospitality and I would never have found one of the main limestone outcrops if John had not guided me to it.
I stole my map from the late Captain F.W.Short. Poirieria Vol. 2 Pt.5.

Buccinulum _linea_ or _Buccinulum_ _lineum_? by Ian Scott

With the use by Powell of the name _Buccinulum_ _linea_ in his book "New Zealand Mollusca" one would have thought that collectors would have happily followed suit. However, this is not the case, and many collectors continue to use the name _Buccinulum_ _lineum_. The confusion arises because Ponder in his paper "A review of the New Zealand recent and fossil species of _Buccinulum_", which was published in 1971, used the name _lineum_. To understand the difference in these two names one needs to know a little Latin. The name _linea_ is a feminine noun meaning "a linen thread or string"; whereas the name _lineum_ is an adjective meaning "made of flax or linen". In a paper published in the Journal of the Royal Society of New Zealand, 1976, Volume 6, Number 2 by Beu, Cernohorsky, Climo, Dell, Fleming, Marshall, Maxwell, Ponder, and Powell the issue was hopefully settled for good. They decided on the name _Buccinulum_ _linea_ after due consideration of the Latin meaning of each name. For some unknown reason Powell does not refer to this paper in the bibliography of "New Zealand Mollusca" although he obviously uses its findings in his choice of _linea_ as the name for this species. Thus hopefully all New Zealand collectors will now follow suit and use the correct name!

The other matter discussed in the above paper was which species was Martyn referring to when he drew the holotype of _Buccinulum_ _linea_. The above authors decided that he was in fact referring to _linea_ and not to _Buccinulum_ _pallidum_ _powelli_ (Ponder, 1971). The specimen on which this illustration was based can not be found, and the illustration itself does not look exactly like either species! They settled on _linea_ because the illustration has features such as the small protoconch of _linea_ and the spire angle and number of spiral lines fit better into the range of variation of this species. In addition, information suggests that the now misplaced holotype was collected on Cook's third voyage in which his only New Zealand stop was at Queen Charlotte Sound; a place too far south for _pallidum_ _powelli_. Thus they name a neotype collected from Titirangi Bay on the outer coast of the Marlborough Sounds which is as similar as possible to Martyn's original illustration. My only complaint is that the shell they have chosen is apparently subadult since they describe it as having a thin outer lip. This is because they could not find a decent adult shell at this locality and one hopes that this will not lead to further confusion in the future.

REFERENCES:

"A review of the New Zealand recent and fossil species of _Buccinulum_" W F Ponder, 1971

"A neotype for _Buccinum_ _linea_ Martyn, 1784" A G Beu, W O Cernohorsky, F M Climo, R K Dell, C A Fleming, B A Marshall,P A Maxwell, W F Ponder, and A W B Powell

A closer look at Buccinulum pallidum powelli (Ponder, 1971)
by Ian Scott

Buccinulum pallidum is distinguished from Buccinulum linea by having a larger protoconch, a more-or-less straight anterior canal, the absence of prominent apertural ornament, and by having a different radula. Buccinulum pallidum pallidum is found from Cook Strait south to Stewart Island and has prominent spiral sculpture and a dull surface texture. It is variable in colour pattern, ranging from white to brown-lined forms. Ponder named Buccinulum pallidum powelli for a northern species found on the east coast north of East Cape which differs in that it lacks the spiral sculpture and has in fact a shiny appearance. Generally it is fairly consistent in colour pattern, having 10 or 11 dark brown spiral lines on the body whorl. Ponder did, however, mention an all white shell from Okupu, Great Barrier Island which he thought also belonged to this subspecies.

Over the last few years I have collected large numbers of Buccinulum from East Cape to Spirits Bay and have come to the conclusion that what at first seemed to be two easily separable species is not as straightforward as it seems. Shells collected on the offshore islands are easy to separate because most specimens of linea are axially ribbed on the body whorl whereas specimens of pallidum powelli are smooth. The only axial ribbing on pallidum powelli is on the top few whorls of the teleconch. This is illustrated by the shells shown in the top row of Figure 1 - those on the left are pallidum powelli whereas the four shells on the right are linea.

However, when we come to the mainland things are not so well defined; and the next two rows of shells in Figure 1 illustrate this. The middle row shows shells found in the Matheson Bay to Cape Rodney area at depths of 3 to 15 m. The three shells on the left are typical pallidum powelli except that they show considerable variation in their background colour. The next shell has the large protoconch of pallidum powelli but although an adult shell, is considerably smaller and has more spiral lines. The final five shells in this row are linea with small protoconchs and very varied colour patterns. Since this photograph was taken I have also found a pure white large shell with a large protoconch.

The bottom row of shells in Figure 1 were all collected in the Whatawhiwhi area on Karikari Peninsula. Here there seems to be a complete gradation from typical pallidum powelli on the left to linea on the right. If we use size of protoconch as the defining feature, then all but the two shells on the right would be classified as pallidum powelli. If this is the case, then there is obviously considerable variation in the shape of this species as it would encompass squat-shaped shells as well as the more typical slender form. All the shells in this row are smooth on the body whorl. Often in linea the spiral lines of colour are raised slightly to the extent that they

can be felt if a finger nail is run over the shell surface; but this is not the case with any of these specimens. Hopefully in the future looking at the radula of different specimens may provide clarification.

Shells collected at other localities show similar problems when we come to split them into two species - there are always a couple of shells that defy easy classification. A shell was collected in the Mercury Islands that had the large white protoconch and slender shape of pallidum powelli but with obsolete spiral lines and a streaky brown pattern on the body whorls. There appears to be a slight difference in habitat when the shells are found subtidally - linea are typically found under rock slabs were there is some detritus or sediment; whereas pallidum powelli are found in rock cracks or crevices away from sediment.

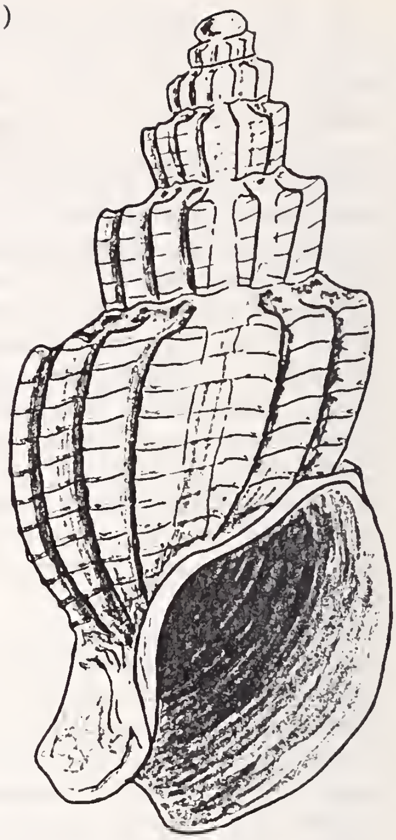
In conclusion, I do think that there are two separate species present. However, it is not always easy to separate individual specimens on shell morphology alone. The most consistent features of pallidum powelli are the large always white protoconch (it is variable in colour in linea); the more elongated shell; and the smooth body whorl. The animals of both are similar in appearance but perhaps the radula holds the key to their separation. I sometimes wonder why Ponder chose to place powelli in the pallidum complex as in many ways they look quite different. However, this is another story and one I have not researched enough at this stage. All species within the Buccinidae are very variable and I am sure the final word has not been written.

FIGURE 1

Top row: Buccinulum from Tryphena, Great Barrier Island
Middle row: Buccinulum from Matheson Bay to Cape Rodney
Bottom row: Buccinulum from Whatawhiwhi, Northland

Cominella mirabilis canturiensis (DELL, 1951)

by Margaret Morley



This is the second in a series of drawings of species not illustrated in "New Zealand Mollusca" by A W B Powell. The specimen shown was trawled at a depth of 520 - 600m on the Otago Shelf in 1980. It is 20.8mm in length and 9.2mm in width. In colour it is creamy white with indistinct spiral bands of pale ochre yellow at the periphery of each whorl plus one on the base. For a general description refer to pages 194 & 195 in "New Zealand Mollusca".

Acknowledgments:
Thanks to Jenny Raven who sent me the shell during exchanges.
Thanks to R C Willan for identifying the shell.

FIGURE 2

Top row: Left - C. consociata (Off Three Kings, 200-270 m)
Right - C. kiwaensis (S E of Cape Campbell, 450 m)
Middle row: C. taiaroa (Off Otago coast, 120-200 m)
Bottom row: C. dichroa (From blue cod guts, Stewart Island)

Deeper Water New Zealand *Chlamys* by Ian Scott

One of the characteristics of *Chlamys* is the large amount of variation within a particular species. Thus in *Chlamys zelandiae* we find a range of colours from yellows and reds through to purples and browns, along with every shade in between; and then patterned shells with combinations of these colours as well. The same story is repeated in shell sculpture with variation from smooth ribbed to spinose forms. While most collectors are familiar with this, they probably have less idea of the variability of the deeper water species. Thus I am attempting to show this in the accompanying photograph and in addition illustrate some of these species in colour for the first time.

The most variation is shown by *Chlamys dichroa*. These are shown on the bottom row of the photograph and they range in colour from red through various patterned forms to yellow. The yellow colour form is very rare, and the specimen shown is from the Penniket collection. Juvenile shells are more likely to be patterned than adult shells. The shell sculpture appears to be relatively constant with the flat-topped radial ribs being a defining feature. Some shells, however, appear to be more "flattened" than others.

By comparison, *Chlamys taiaroa* show less variation. The colour in all specimens I have seen ranges from reddish-pink to orange-pink, with small amounts of patterning on some shells. It can in general be separated from *Chlamys dichroa* because the ribs are triangular rather than flat-topped in section. However, some shells are difficult to classify and appear to show features of both species - I feel more work needs to be done here. *Chlamys dieffenbachi* have an overlapping habitat, but can usually be separated because the ribs are spinose to varying degrees. *Chlamys taiaroa* are shown in the second row of the photograph.

For the two deep water species, *Chlamys consociata* and *Chlamys kiwaensis*, too few specimens are available in private collections to really confirm their variability. From what I have seen, *Chlamys kiwaensis* is very consistent in colour pattern and is always a very pale colour with a pinkish tinge to the ribs. *Chlamys consociata* is similar in colour. The sculpture of *Chlamys consociata* presents a problem, and is either variable, or else this species is being wrongly identified in some collections. The specimens shown in this photograph have been identified at the National Museum in Wellington.

Shells discussed here are illustrated in Figure 2 on page 9.

Deep Water _Amalda mucronata_ by Ian Scott

Last year many collectors were able to obtain deep water _Amalda mucronata_ for the first time. These shells were obtained from prawn trawl boats working at depths of 400 to 450 m off the Bay of Plenty coast where the sea floor is a grey muddy sediment. At first these shells appeared to be different from shallow water specimens since they were all very elongated and lacked a significant callus at the top of the aperture. In addition they were larger than any shallow water shells we had collected. Four such shells are shown in the top left of Figure 3.

If you look in "New Zealand Mollusca" by A W B Powell you will find he lists their habitat as ranging from shallow water to 250 fathoms - a marginally greater depth than where these shells came from. For size he gives 61mm as the maximum recorded length - the largest shell in Figure 3 is 54mm, slightly smaller than this. Powell does not state whether this maximum length came from a deep water shell.

The other shells figured are all shallow water specimens typically trawled at depths of 15 to 30 m. Their range extends from the top of the South Island to all of the North Island, and specimens covering this range are illustrated here. The most obvious feature here is that the degree to which callus is developed around the spire at the top of the aperture is a very variable feature. In fact some shells have very little callus at all and are quite similar in appearance to the deep water shells. Similarly, there is considerable variation in shell shape with a mixture of short squat specimens as well as more elongated ones. It becomes clear from all this that the deep water specimens fall within the range of this species.

FIGURE 3
Top row: Left - 400-450m off Bay of Plenty; Right - Doubtless Bay
Bottom row: Left - Hauraki Gulf; Right - Tasman Bay to Golden Bay

ITEMS OF INTEREST

Paryphanta busbyi are on the move again! Pauline Mayhill of Tauranga writes: "Recently I was asked to look at a piece of bush off Soldiers Road on the Tauranga side of the Kaimai Ranges where large snails had been reported. They were indeed present, as within 15 minutes I had found three live Paryphanta busbyi of varying size, so the colony is obviously in good health. It is known that the previous owners had a son farming in the North and hence it is quite possible there has been an assisted migration. How to account for another busbyi shell found one kilometre away in a different water catchment area is more tricky. A further shell report was referred to me from the Paeroa end of the Ranges. Over the years I have investigated a number of reports of busbyi after a single shell has been found, and I have searched as far south as the Tawerau Forest. Despite much time and energy being spent, no further shells have been discovered. If any members have records or information pertaining to the Kaimai Ranges I would be most interested to learn of them."

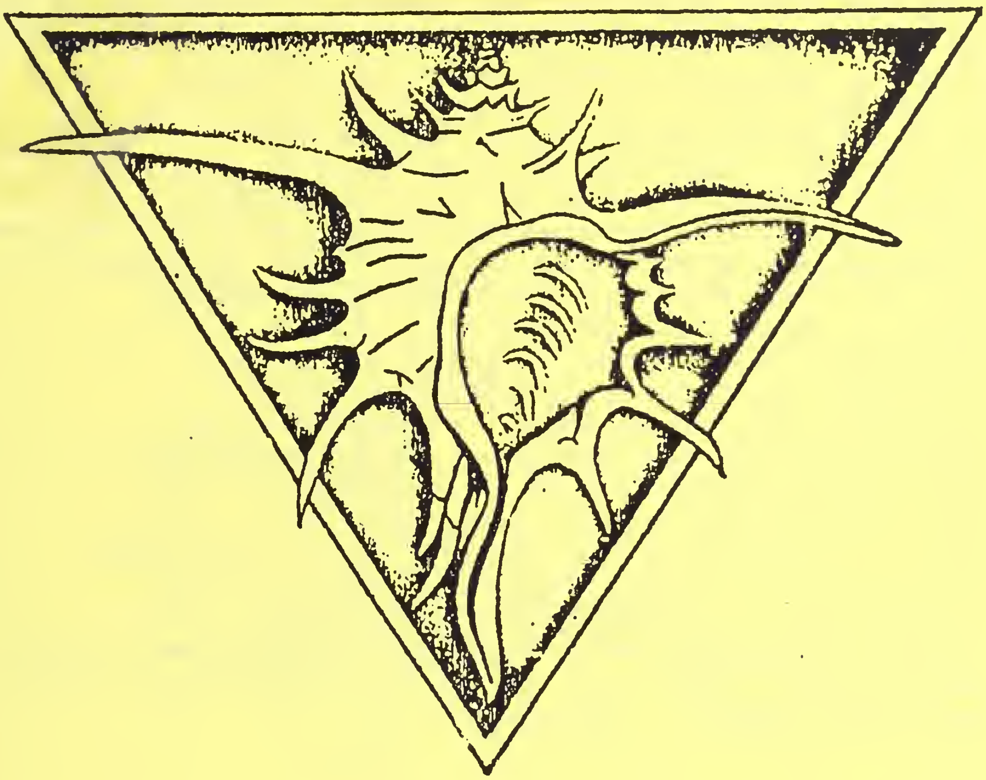
In the last issue of Poirieria Nancy Smith wrote about an unnamed hairy snail from the Mariana thermal vent. This shell has now been named as a new genus and species and could well be a new family as well. It is named Alvinconcha hessleri (OKUTANI & OHTA, 1988) and is similar to members of the Trichotropidae or Hipponiacea. Our thanks go to Professor Takashi Okutani for sending us this information.

Margaret Morley had requested information on the southern distribution of Cominella virgata virgata and several club members have sent her data. Bruce Hazelwood reported that it occurs all down the east coast of the North Island to Oriental and Lyall Bays in Wellington. Hugo Hollis reported that it is plentiful on low tidal rocks at Pukerua Bay and at the southern headland of the entrance to Porirua Harbour. Peggy Town has collected specimens near Nelson.

Ian Scott has some further information about his "new species" of Muricopsis discussed in the last issue. Firstly, there does appear to be a difference in the external appearance of the animals. The Muricopsis sp. has a uniformly coloured pale peachy white animal; whereas in Muricopsis octogonus the animal is marbled with the above colour plus a darker orangy-brown. In addition, several people have pointed out that the "new species" has a larger aperture and a more flared lip flange.

Earlier this year, Frank and Verna Johnson found a very small but fully adult Struthiolaria papulosa on the ocean side of Matakana Island in the Bay of Plenty. It measured 46 mm in length - can anyone better this? Please write in with other records of very small or very large New Zealand shells.

POIRIERIA



Auckland Museum
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EDITORIAL

I would like to dedicate this issue of Poirieria to the memory of Norman Douglas. To those who knew him he was both a friend and an inspiration. I think it is fitting that the main article in this issue is a lengthy study of local landsnails by Jim Gouldstone - Norman would have appreciated the dedication and detailed effort that went into Jim's work. However, rather than me writting more, I would like to use instead this poem entitled "Thankyou Norman"; written by Isabel Rigden, and read at Norman's funeral service:

"Thankyou, Norm for the tales you've told
Of hunting trips and stags so bold
Of West Coast fishing - fish by the sack
And bringing them home on your horse's back
Thankyou, Norm, for the skills you've shown
Tricky shells you've cleaned, rare snails you've grown
You've shown us your land in all kinds of weather
And its quite fantastic, how you make leather
Thankyou, Norm, for your camera skills
Photos of frogs in the Coroglen hills
We haven't your skill or patience yet
But things you've taught us we won't forget
Thankyou, Norm, for the great trips we've had
You really must have been quite a lad
When we first knew you, you'd gone quite grey
But could still out walk us any time of the day
Thankyou, Norm, for teaching us how to look
In the field, by seashore, researching a book
Through your eyes we've found our boundaries extend
Thankyou and bless you, for being our friend
Thankyou Norman."

Ian Scott
25 Halston Road
AUCKLAND 4

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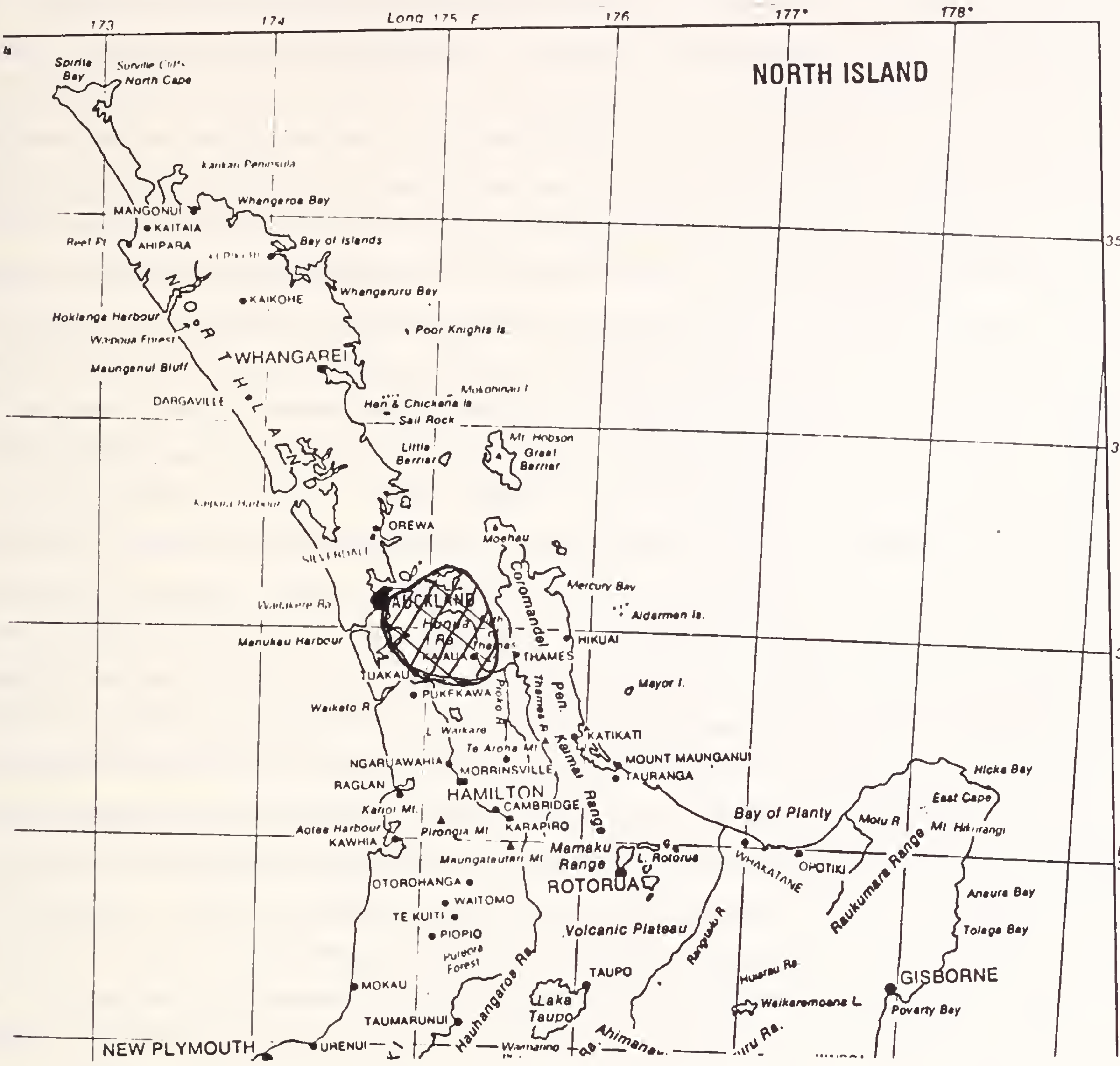
LAND SNAILS FROM SOUTH AUCKLAND 1990

This is a detailed record of my collecting over several years. It replaces a sketchy report (unpublished) I did in 1977 and complements a similar record from



the Waitakeres (Poirieria Vol.13 No.1 1983), Rangitoto (Poirieria Vol.15 No.2 1986), and more unpublished reports from the Coromandels (Coromandel 1979, Moehau 1980, Great Barrier 1981, Mill Ck. Whitianga 1983.). Native snails for the most part require native bush but will exist quite happily under many introduced plants if the cover is continuous and stable, but Radiata Pine is anathema to them. The pressure on bush areas in South Auckland is intense, even the Hunuas are losing their native cover for one reason or another in some cases to be replaced with pine. Although some small areas are being replanted, unless they are connected with existing native bush they will eventually colonize with introduced snails.

There are not many species of introduced snails in South Auckland but numbers within those species are astronomical and there are some real "horrors" lurking just beyond our shores. Two natives can be found in gardens around Auckland. They are **Tornatellinops novoseelandica** and **Paralaoma caputspinulae** and they are particularly prolific in the stone walls of Cornwall Park. **Tornatellides subperforata**

and **Phrixgnathus cf ariel** can also be found in modified situations near the sea. All four species give the impression that though they have certainly been here a long time, in geological terms they could be more recent arrivals.

All these snails I have identified from shell features only, a task which for some species is quite difficult for they so closely resemble others. In the case of the introduced genus **Oxychilus** I believe it is impossible to separate the three or four species we have here on shell features alone, which is a nuisance for this is our most prolific genus. However, I have not put a lot of effort here into the introduced species but rather concentrated on the dwindling natives. These I have mostly taken from leaf litter samples collected in the field but sorted at home with a strong light and some magnification. Most of the snails collected this way are dead and the numbers collected may give a distorted picture of the true situation. Slugs of course are never collected this way and things like **Otoconcha** with its thin shell, very rarely. Generally speaking the bigger the shell the longer it will last and the lists reflect this. At the one millimetre size snails seem very scarce because their shells probably only last a few days once the animal dies.

The only previous records I have seen from this area are those in Suter's Manual and I have included his records at the end of this report. Suter collected many species in the Mt.Wellington lava fields and at the time of my 1977 report there was still a lovely little oasis left with many native species still intact, notably **Phrixgnathus cf lucidus**; but this small area ten years on is now buried in rubbish. Probably some species have been lost. An excavation of middens on the fast disappearing Ellets Mt. in Mangere recently turned up a semi-fossil snail belonging to a species allied to **Mocella rakiura (Powell).** When Dr. Climo sent me some photos of this shell he added, "this magnificent snail must still be around the Auckland Isthmus somewhere". But I have failed to find it and must assume that it has gone.

I have divided my lists into four categories of comparitive safety.

1. The Hunua Ranges around the water catchments where the largest areas of continuous bush still exist.

2.Reserves with secure status containing bush more or less intact from early days. In practise this means bush which has had all the millable timber removed.

3.Modified Reserves with secure status but have been eaten out underneath in the past by animals.Some of them have been reserved for a long time and the understorey almost completely restored, but the native snails have gone and in some cases have been replaced with introductions

4.Threatened sites where there is no commitment to retain the bush and odd bits and pieces around the city which have retained a few native species. These sites have also produced the most introduced species and this is largely the only collecting I have done of these.

Each area in New Zealand produces its own distinctive list of native snails and the real expert could tell where he was by thespecies and numbers of snails he found. **Mocella eta** is the commonest native in our area showing up in the deepest bush and the scrappiest remnant. **Liarea egea** is a prominent snail particularly around the edge of bush and **Phrixgnathus erigone** with its northerly range is at its best in our area.

Two species are the nearest we have to an endemic snail living in South Auckland. **Chaureopa microumbilicata Climo** extends a little further north and south and **Phrixgnathus cf lucidus** extends just as far as the Coromandels. This latter though very small has a lovely shiny shell with broad straight brown radial bands on an ivory coloured base. **Rhytida dunniae** is at its southern extreme in the Hunua Gorge while **Cavellia anguicula, Flammulina zebra**, and **Cytora chiltoni** are at their fartherest north. Less expected is a very strong east-west orientation. **Liarea hochstetteri carinella** and **Phenacohelix cf pilula** which are very common in the Waitakeres and the Manukau Peninsular, in our collecting area just show up at Bombay through to Patumahoe. All the **Delos coresias** I saw were of the paler yellowish variety and there were none of those with the bright red radials that were such a feature in the Waitakeres. **Delos jeffreysiana** shells somewhat rare also tended to be without much colour pattern. The appearance of **Delos cf coresia** is very odd as it has previously only been recorded from the Central Plateau Desert Rd. area. **Punctid n.sp.55** particularly common in this area in young regenerating bush never seems to have the high pallatal lammela seen in older Waitakere specimens. **Cytora pallida,** common in the Waitakeres is absent in South Auckland.

Two sites I have returned to quite a few times over the last fifteen years.One is the regenerating bush site below the Mangatawhiri dam, the other a small coastal strip close to home adjacent to the airport runway.The first site was joined to a piece of virgin bush, and consisted of young leafy Rimus with spindly Tanekaha. The ground was covered with a thick mulch of Rimu leaves amongst which hundreds of snails browsed. The first time I sampled it there was an explosion of **Punctid n.sp.55**, a year later they had been replaced by an explosion of **Laoma pirongiaensis, then it** was the turn of **Phrixgnathus fulguratus** in fact the numbers were constantly changing. Now the Rimus are tall and leggy, shedding very few leaves but the Tanekaha are prominent and their small hard leaves dominate the litter. Snails are scarce but all the original species still seem to be there, perhaps waiting for the Rimus to again assert themselves. The adjoining virgin tract with its huge trees deep permanent litter and varied but stable snail populations, has gone and in its place an eroding wasteland. I felt the loss of this magnificent bush very keenly at the time for it wasn't needed for dam constuction even if the Lower Mangatawhiri Dam had proceeded, it was merely felled for profit. Such a piece of untouched forest, so accessible, should be untouchable by any authority.

The coastal strip by the Auckland Airport has seen some different changes. Before the runway was built it was exposed to the prevailing wind and considerable salt spray **Thalassohelix ziczag** and **Therasia decidua** dominated the litter with about 15 species of smaller coastal type natives also present. Conditions changed drastically when the airport was built, for this exposed coast was turned into a large shallow bay with quickly colonizing mangroves. Today the mangroves are large, engulfing the beach right up to the edge of the bush. I have followed the possible changes in the snail populations with interest and the results have been equally drastic. Today the native snails have nearly disappeared and there places taken by hordes of **Oxychilus.** The bush itself,Pohutukawas, Kawakawa, Mahoe, Tree Fern and fringing flax, has all flourished but the ancient snails have succumbed to "progress".

ACKNOWLEDGEMENTS. I continue to get valuable information from Dr. Climo who has always freely offered advice and encouragement.
Bruce Hazelwood has been my constant adviser and sometimes companion on collecting trips.

LIST OF SPECIES. A lot of snails are still without names. I have kept names and numbers consistent with the Waitakere Report. Punctid numbers are those used by Dr. Climo, "Mocella" numbers are my own. I hope that illustrations and modest descriptions where necessary will be sufficient to identify the species at least for those collecting in this area.

Rhytida dunniae (Gray)
Delos coresia (Gray).
Delos jeffreysiana (Pfeiffer).
Omphalorissa purchasi (Pfeiffer).
Cytora hedleyi (Suter).
Cytora torquilla (Suter).
Liarea egea egea (Gray).
Tornatellinops novoseelandica(Pfeiffer)
Phenacharopa pseudanguicula (Iredale).
Charopa coma (Gray).
Charopa pilsbryi (Suter).
Paracharopa chrysaugeia (Webster).
Chaureopa hazelwoodi Climo.
Chaureopa titirangiensis (Suter).
Geminoropa cf cookiana (Dell).
Geminoropa huttoni (Suter).
"Mocella" sp. 1
"Mocella" sp. 4.
Huonodon pseudoleioda (Suter).
Cavellia buccinella (Reeve).
Fectola infecta (Reeve).
Fectola unidentata Climo.
Flammocharopa cf costulata (a).
Therasiella celinde (Gray).
Therasiella cf neozelanica.
Therasiella tamora (Hutton).
Flammulina cornea (Hutton).
Flammulina feredayi feredayi (Suter).
Flammulina perdita (Hutton).
Suteria ide (Gray).
Thalassohelix ziczag (Gould).
Allodiscus dimorphus (Pfeiffer).
Allodiscus planulatus (Hutton).
Allodiscus urquharti Suter.
Phenacohelix ponsonbyi (Suter).

Rhytida greenwoodi greenwoodi (Gray).
Delos cf coresia
Otoconcha dimidiata (Pfeiffer).
Cytora cytora (Gray).
Cytora septentrionale (Suter).
Cytora chiltoni (Suter).
Liarea hochstetteri carinella(L.Pfeiffer).
Tornatellides subperforata (Suter).
Phenacharopa cf pseudanguicula
Charopa montivaga Suter.
Pseudegestula transenna (Suter).
Paracharopa fuscosa (Suter).
Chaureopa microumbilicata Climo.
Egestula egesta (Gray).
Geminoropa vortex (Murdoch).
Mocella eta (Pfeiffer).
"Mocella" sp. 3.
Huonodon hectori (Suter).
Cavellia anguicula (Reeve).
Cavellia reeftonensis (Suter).
Fectola mira (Webster).
Flammocharopa costulata (Hutton).
Flammocharopa cf costulata (c).
Therasiella neozelanica Cumber.
Therasiella serrata Cumber.
Flammulina chiron (Gray).
Flammulina crebriflammis (Pfeiffer).
Flammulina cf feredayi.
Flammulina zebra (Le Guillou).
Therasia decidua (Pfeiffer).
Serpho kivi (Gray).
Allodiscus miranda (Hutton).
Allodiscus tesselatus Powell.
Phenacohelix giveni Cumber
Phenacohelix pilula (Reeve).

Phenacohelix cf pilula.
Laoma marina (Hutton).
Laoma cf marina (a).
Laoma poecilosticta (Peiffer).
Laoma mariae (Gray).
Phrixgnathus cf ariel.
Phrixgnathus fulguratus (Suter).
Phrixgnathus lucidus Suter.
Punctid sp. Wairoa.
Phrixgnathus glabriusculus (Pfeiffer).
Phrixgnathus moellendorffi Suter.
Punctid cf n.sp. 55.
Pasmaditta cf jungermanniae
Phrixgnathus serratocostatus Webster.
Obanella rimutaka Dell.
Paralaoma lateumbilicata (Suter).
Punctid n.sp. 1.
Punctid n.sp. 6.
Punctid cf n.sp. 7.
Punctid n.sp. 17.
Punctid n.sp.30.
Punctid n.sp. 33.
Punctid n.sp. 40.
Punctid n.sp. 69.
Suterilla neozelanica (Murdoch).
Cochlicopa lubrica (Müller).
Oxychilus cellarius (Müller).
Helix aspersa (Müller).
Lauria cylindracea (da Costa).
Vitrea crystallina (Müller).

Laoma leimonias (Gray).
Laoma cf marina.
Laoma pirongiaensis Suter.
Laoma transitans (Suter).
Phrixgnathus ariel (Hutton).
Phrixgnathus conella (Pfeiffer).
Phrixgnathus erigone (Gray).
Phrixgnathus cf lucidus.
Punctid sp. Ngaheretuku.
Phrixgnathus cf glabriusculus.
Punctid n.sp. 55.
Pasmaditta jungermanniae (Petterd).
Pasmaditta miserabilis (Iredale).
Phrixgnathus viridulus Suter.
Obanella cf rimutaka.
Paralaoma caputspinulae (Reeve).
Punctid n.sp. 5.
Punctid n.sp. 7.
Punctid n.sp. 8.
Punctid n.sp. 29.
Punctid n.sp. 32.
Punctid n.sp. 38.
Punctid n.sp. 43.
Potamopyrgus antipodarum (Gray).
Athoracophorus sp.
Oxychilus allarius (Miller).
Oxychilus draparnaldi (Beck).
Vallonia excentrica (Sterki).
Vertigo ovata (Say).

SITES IN THE HUNUA RANGES. All these sites are on the track around the catchment are which the A.R.C. have just recently completed. I didn't really collect much much within the catchment reserve. This saved asking for special permission and I felt that on the whole I probably obtained most of the species the area held.

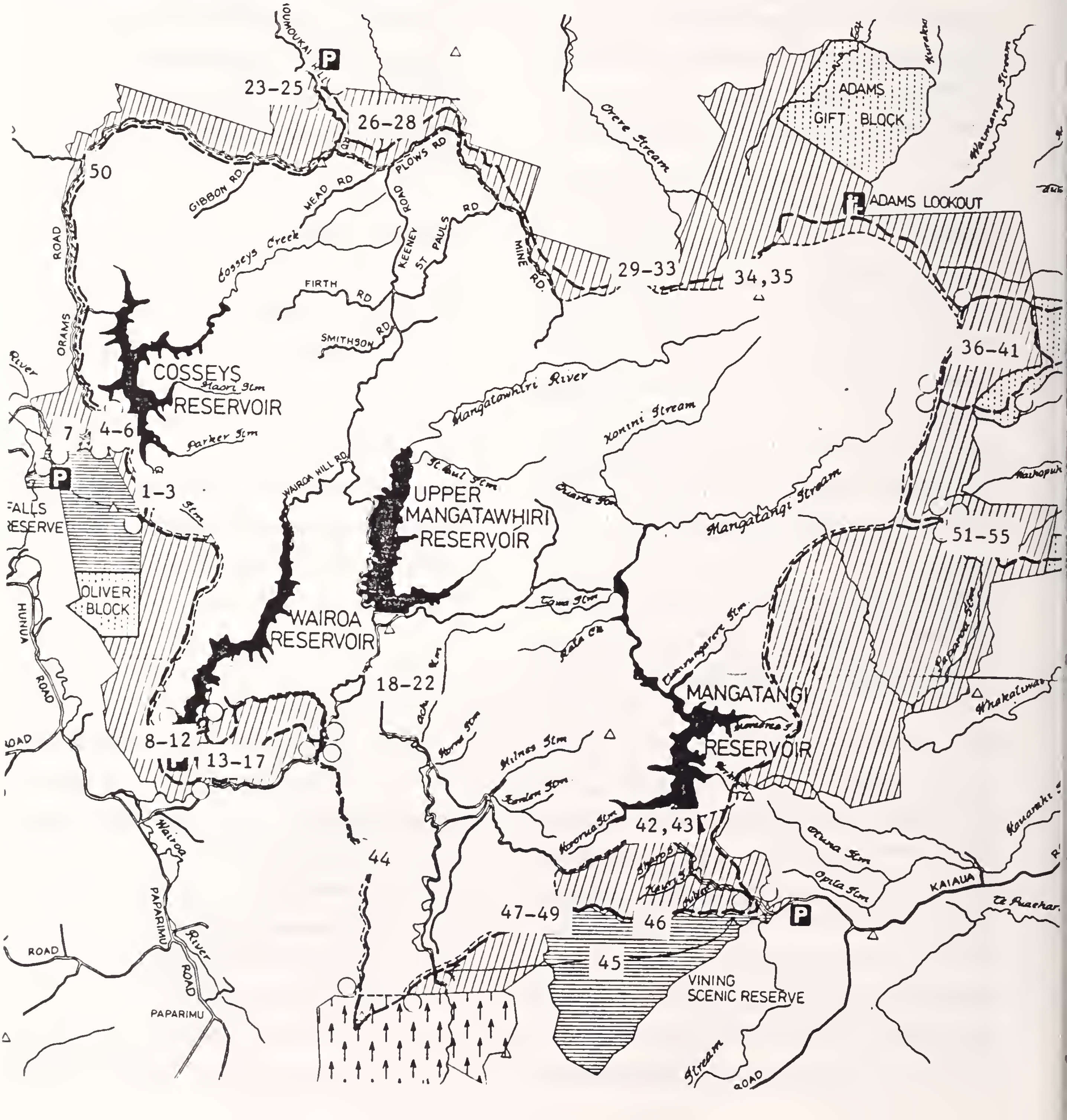
1. Cossey's Dam to Wairoa Dam track, 3/83 1 litre of leaf litter from under a large dead Totara. 2. Under a Rimu between the lookout platform for Cossey's Dam and the junction with the Hunua Falls track, 1 lt. 3. 1 lt. under Taraire at junction with Hunua Falls track. Cossey's Dam, 8/79. 4. Under Tawa adjacent to the picnic area, 1 lt. 5. 1 lt. under RImu as before. 6. 1 lt. under Blechnum beside the road. Hunua Falls, 8/79. 7. Across the stream in dense second growth bush, 2 lts. Wairoa Dam, 8/79. 8. On west bank of valley just below the dam, under a large Rata, 1 9. Same as last on a steep bank under Kiekie, 1 lt. 10. Same under Tree Fern and epi-

phyte, 1 lt. 11. Same under Tawa, a spot where it was very dark, 1 lt. 12. Same under open Broadleaf, 1 lt.

9/83. 13. Under the very large old Kahikatea on the loop track, eastern side, just below the dam, 1 litre. 14. Loop track Tree Fern, 1 lt. 15. Loop track Pukatea, 1lt 16. Loop track Tawa 1, 1 lt. 17. Loop track Tawa 2, 1 lt.

Mangatawhiri, just below the upper dam, the old site, 10/85. 18. 4 litres from the regenerating Rimus. 19. 3 litres under young Matai amongst fallen epiphytes and rotting logs. 20. Alongside the road under crushed Bracken, collected on the spot. 21. Alongside the road under Ti-tree 1 lt. 22. Further to the south down the road, closer to what was the second site sampled in 1976. This was young bush still dominated by Tree Ferns. 4 litres.

Moumoukai Hill Road, 10/83. 23. Close to the road near to the top under a very large old felled Puriri trunk, 2 litres. 24. Under Tawa and Taraire in an old Tawa stump, 2lt



25. 2 lts. under large Puriri trees.

Moumoukai-Waharau Track, western end, 2/11/86. 26.Under a large Rimu 2 lts.27. Under another large Rimu 2 lts.28. Under yet another large Rimu 2 lts.

Mine Rd.-Kohukohunui section of the track, 1/1/87.29. 2 lts. under several old Rimus 30.1 litre shaken out of moss growing on a large dead trunk. 31,32,33. Three lots of 2 lts. each taken around the summit of Kohukohunui. This was the highest point of the Hunuas and though the bush was second growth some quite different snails were found.

Kohukohunui-Waharau track 1/1/87. 34. Just down from the summit under Tawa bark, collected on the spot. 35.1lt. of leaf mould taken under Tawa. The top section of this track contained many fine Tawa.

Waharau Regional Park. 1/1/87. 36. 2 lts. taken under a large Rimu at the top of the network of tracks.

10/83. 37. 1 lt. taken from the base of a dead Rata on the top southern edge of the track network. There were alot of dead Ratas in this area. 38. 1 lt. from another dead Rata. 39. 1 lt. from a dead Rata surrounded by dense Kiekie. 40.1 lt. under a partly dead large Pukatea. 41. 1 lt. under Beech.

Mangatangi Dam. 12/85. 42. 2 lts. under a young leafy Rimu along a side stream just below the dam. 43. 4 lts. from under a rotten log on a steep hill behind the toilet at the dam.(½ way up to the top).

Mangatawhiri Ridge track 30/10/88 44. About 1 hour along the track from Repeater Rd. under Tree Fern and Tawa,4litres. This was regenerating bush on the eastern side of the ridge, on the west it was pine plantation.

Mt. Mangatangi track 3/89. 45. On the spot collecting along the length of the track between Mangatangi and Mangatawhiri mostly under Rimu bark. 46. 1 lt. of litter under a large Rimu on the Mangatangi side of the mountain. 47. ½ lt from the lowest station nearest the Mangatawhiri River. 48. 2 lts. from the second station on the Mangatawhiri side under a very old Pukatea. This place looked particularly untouched. 49. 1 lt.from the third station much nearer the top. The top of Mangatangi is cleared as is much of the northern slope but the track skirts the southern slopes which are bushclad.

Corner of Otau Valley Rd.,McKenzie Rd.,Oram's Rd. 27/8/89. 50. 2 lts under a mixture of Taraire, Tawa, Titoki, Puriri and Tree Fern.

Whakatiwai Regional Park. 1/90. This was the first good bush encountered walking up the track from the road. It was quite high up but had all been cut over. 51. 2 lts taken under two large dead trees, possibly Rimu, which were festooned with Kiekie. 52. 1 lt. from alongside the track under Blechnum. 53. 1 lt uder a small bushy Rimu. 54. 1 lt. taken under a large Tawa. 55. 4 lts. from under a large Rimu, a magnificent tree which had somehow escaped the axe though it was tall and straight.

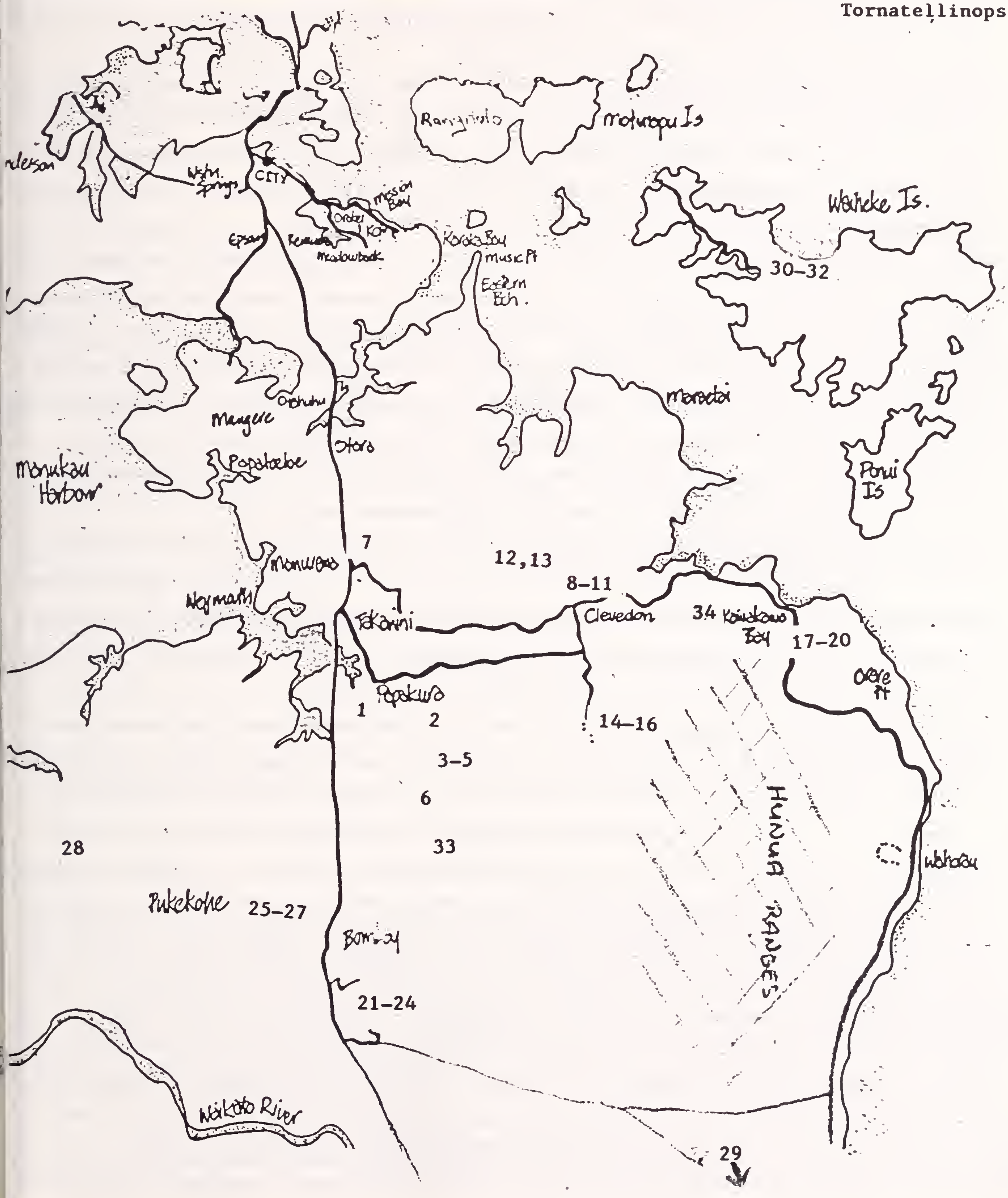
TABLE OF SPECIES. **Rhytida greenwoodi,** 13(1),17(1),26(1),42(1),43(1).**Delos coresia** 3(1),4(6),5(5),9(1),11(3),13(4),16(2),17(1),18(2),19(6),20(1),21(7),22(7),25(4),26(2),28(2),29(1),31(1), 35(1),36(2),38(1),42(2),43(4),44(12),46(1),48(3),49(3),51(1),52(1),55(3).**Delos jeffreysiana**,4(1),9(1),10 (2),19(4),31(2),39(1).**Otoconcha dimidiata**,18(1).**Omphalorissa purchasi**,5(1),10(1),13(6),15(30),16(4),22(20), 44(50).**Cytora cytora**,3(2),5(6),7(1),8(1),9(3),10(3),11(5),12(2),17(2),22(5),26(7),28(10),35(1),36(1),42(3), 44(7),45(1),48(3),49(9),50(5),55(3).**Cytora hedleyi**,10(5),11(7),12(4),48(6).**Cytora septentrionale**,3(1),5(7), 7(1),22(2),26(1),28(2),44(17),45(2),53(1).**Cytora torquilla**,10(1),19(1).**Liarea egea**,2(16),3(6),5(50+),7(2), 8(6),9(24),10(17),11(16),12(8),13(1),14(20),15(3),16(3),17(6),18(9),19(36),20(1),21(4),22(28),23(1),24(3), 25(14),26(5),27(2),28(7),35(1),36(2),37(1),38(6),40(6),42(60),43(22),44(18),46(3),48(4),49(22),50(1),51(2), 53(10),54(3),55(2).**Tornatellinops novoseelandica**,5(1),13(3),25(1),44(1),50(1),55(1).**Phenacharopa pseudan guicula**,13(2),17(1),26(2),27(1),28(1),35(3),42(2),44(1).**Phenacharopa cf pseudanguicula**,25(1),27(1),31(3),

33(1).Charopa coma,1(1),2(5),5(11),8(1),13(78),15(2),16(3),17(21),19(3),25(4),27(16),28(2),29(1),35(7),38
(5),40(3),42(4),44(10),45(5),47(1),48(5),49(2),54(1),55(4).Charopa montivaga,24(1),34(5),37(1),41(3).Char
opa pilsbryi,13(2),18(1),25(1),37(2),38(1),51(1).Pseudegestula transenna,8(2),13(1).Paracharopa chrysauge
13(5),16(2),25(2),34(1),48(1),49(1).Chaureopa microumbilicata,19(4),25(3),27(1),42(1).Chaureopa titirangi
ensis,1(1),13(1),16(3),19(1),32(1),35(2),47(1),49(2),51(1).Geminoropa cf cookiana,3(2),9(1),10(1),13(2),
16(1),21(1),22(2),26(3),27(1),40(1),42(53),44(33),48(1),49(1),51(3),53(1),54(1).Geminoropa vortex,30(5),
35(1).Geminoropa huttoni,30(1),54(1).Mocella eta,4(2),5(23),7(6),9(1),10(6),13(9),14(4),15(9),16(4),17(6),
19(6),21(2),22(1),25(5),26(13),27(8),28(10),29(1),30(2),35(5),36(2),37(3),38(6),40(6),42(2),43(1),45(1),
46(6),48(2),49(17),51(2),55(12).'Mocella" sp. 1,23(5),38(4),39(1),40(3),51(4),52(1),53(1),54(3),55(11).
'Mocella"sp.3,3(1),5(3),10(3),13(5),14(6),16(4),17(4),19(13),22(1),25(3),26(1),29(3),32(1),41(1),42(63),
44(11),49(5),50(3).'Mocella" sp.4,3(1),5(6),8(2),9(2),12(1),25(17),26(6),27(2),28(1),30(2),35(2),36(1),38
(1),42(2),44(2),49(3),50(1).Huonodon hectori,2(1),3(1),5(4),9(1),13(40),15(1),16(1),17(3),19(1),22(1),23(1
25(5),26(1),27(3),28(3),29(1),30(3),31(1),35(4),39(1),40(1),41(1),42(11),44(3),49(2),51(4),55(1).Huonodon
pseudoleioda,9(1),11(1),12(10),14(2),18(5),19(2),22(1),24(1),25(2),28(4),29(1),30(4),31(3),32(1),35(12),
37(2),42(2),43(8),44(3),46(2),48(1),49(2).Cavellia anguicula,40(1),49(7),53(1),54(1).Cavellia buccinella
2(5),3(1),4(3),5(12),10(25),12(1),13(1),14(1),16(2),17(2),18(2),19(11),22(6),26(22),28(8),30(2),33(1),35(1
36(2),38(2),39(3),42(4),44(5),48(6),51(2),53(1),55(2).Cavellia reeftonensis,7(1),11(2),22(1),26(1),28(1),
35(1),39(1),46(2),48(1),51(1).Fectola infecta,22(1),26(1),27(2),42(2),43(2),44(1).Fectola mira,17(1),27(4)
38(1).Fectola unidentata,22(1).Flammocharopa costulata,10(1),19(1),28(1),37(2),38(2),39(1),42(1),48(1),51
(1).Flammocharopa cf costulata (c),10(1),50(1),Therasiella celinde,2(1),3(1),5(2),7(2),8(25),15(4),19(1),
24(1),26(3),28(10),29(1),30(2),31(4),32(1),35(3),36(1),37(3),38(1),39(2),40(2),41(5),43(15),44(9),45(5),
46(1),48(8),50(4),52(1),53(1),55(13).Therasiella neozelanica,2(1),5(14),7(2),8(2),10(12),11(8),13(1),15(1)
18(1),19(4),21(2),22(5),24(1),25(1),26(8),27(7),29(4),32(2),33(1),37(1),38(3),39(1),42(13),43(60),44(2),
48(2),49(14),50(1),51(2),55(2).Therasiella cf neozelanica,28(25),43(3),44(3),48(6),51(1),53(2).Therasiella
tamora,2(4),3(4),10(2),22(2),23(2),25(1),26(10),27(6),28(4),29(9),33(1),35(1),47(1),49(1),50(2).Flammulina
chiron,14(1),21(1).Flammulina cornea,3(1),18(1).Flammulina crebriflammis,10(1).Flammulina feredayi,7(1),
8(1),21(2),26(1),46(1),47(1),50(1).Flammulina cf feredayi,31(1),35(1).Flammulina perdita,3(1),5(1),19(1),
20(1),21(1),22(1),25(10),35(1),44(1),53(1).Flammulina zebra,31(1),32(1).Suteria ide,5(1),15(3),26(2),27(1)
28(1),31(1),36(1),39(1),43(3),44(9),49(3),53(1),54(1),55(2).Therasia decidua,44(1),49(1).Thalassohelix
ziczag,3(1),7(1),10(1),12(1),14(1),15(1),17(1),24(1),42(1),44(1),49(1),50(1),51(1).Allodiscus dimorphus,
9(1),13(3),14(1),17(1),27(1),28(2),42(3),44(1).Allodiscus miranda,32(1),49(1).Allodiscus planulatus,23(1),
31(1),43(11),49(1).Allodiscus tesselatus,32(1),44(1).Allodiscus urquharti,17(1),19(5),21(2),22(5),26(7),
27(3),35(2),36(1),44(6),46(1),48(2),50(14),51(2),53(1).Phenacohelix giveni,1(1),3(1),8(10),9(11),13(36),
14(4),15(1),16(1),17(12),19(1),20(2),21(4),22(1),25(3),26(4),27(18),28(7),29(1),30(1),35(2),36(2),40(3),
42(2),44(9),47(1),49(3),50(4),51(6),54(1).Phenacohelix ponsonbyi,5(8),6(1),21(3),44(4).Phenacohelix pilula
21(2),28(3),36(1),38(2),46(4),48(3).Laoma leimonias,1(2),2(1),4(4),7(9),13(3),19(13),22(7),23(1),24(2),25
(4),26(2),27(3),28(1),29(1),44(11),49(19),50(3).Laoma marina,15(1),19(1),22(4),25(2),26(3),27(3),30(1),31
(2),43(3).Laoma cf marina,2(4),3(5),4(4),5(17),7(1),9(2),10(5),11(7),13(3),15(19),17(2),19(2),22(10),23(2)
24(3),25(4),26(1),40(3),42(1),44(30),48(3),50(13).Laoma pirongiaensis,1(3),2(1),3(3),7(7),9(7),10(68),11(7
12(6),14(11),15(6),16(3),17(2),18(1),19(7),22(5),28(1),30(2),31(3),32(4),33(3),35(3),36(1),37(2),38(5),42
(27),43(2),44(30),48(11),49(2),52(5),54(1),55(7).Laoma poecilosticta,7(1),8(3),14(2),15(2),19(2),22(4),26
(1),42(28),43(6),44(23),46(1),47(2),49(1),50(16).Laoma transitans,27(1),29(1),30(1),32(3),52(1),55(3).
Laoma mariae,23(1),26(4),27(2),28(4),31(1),35(1),44(2),45(1),48(1).Phrixgnathus ariel,5(8),7(2),8(1),13(6)
15(1),16(3),17(4),19(4),21(1),22(2),25(10),26(1),28(2),29(1),35(2),38(2),41(2),44(1),45(1),48(1),49(7),55
(1),Phrixgnathus conella,2(1),5(6),7(3),8(1),13(1),15(7),25(4),26(1),28(1),32(1),35(1),37(2),38(4),39(2),
40(4),45(2),46(6),47(2),48(10),49(4),50(1),54(2),55(1).Phrixgnathus fulguratus,2(4),4(6),8(4),9(5),10(18),
11(1),13(7),16(1),17(4),18(2),19(2),21(3),26(8),27(6),28(1),29(3),30(2),31(2),32(3),33(2),38(2),42(35),44
(2),49(1),51(4),52(2),55(8).Phrixgnathus erigone,2(1),3(1),4(1),5(3),6(1),7(1),8(11),9(5),10(4),13(70),14
(5),15(4),16(5),17(25),19(1),21(20),22(1),23(2),24(2),26(40),27(8),28(18),29(3),30(2),31(6),32(4),33(2),
35(7),36(3),37(3),38(2),40(2),41(2),42(12),43(2),44(25),46(2),47(2),48(5),49(20),50(6),51(9).Phrixgnathus
lucidus,8(2),9(2),14(1),17(3),19(1),22(6),23(5),24(6),26(5),36(1),42(1),44(3),48(1),50(31).Phrixgnathus
cf lucidus,22(1),26(1),33(4),35(2),42(2),43(1),44(16),48(3).Punctid sp. Wairoa,8(1),Phrixgnathus glabriusc
ulus,2(1),9(1),26(1),27(5),47(5).Phrixgnathus cf glabriusculus,13(62),14(1),17(7),44(38),47(7),Punctid n.
sp.55,18(5),27(3),28(18).Pasmaditta jungermanniae,13(1),18(1),25(3),26(1),50(2).Pasmaditta miserabilis,10
(1),18(3).Phrixgnathus serratocostatus,13(2),21(1),26(1),27(2),28(1),49(1).Phrixgnathus viridulus,19(1),
22(2),28(3),31(1),35(5),36(2),48(1),49(1),50(2).Obanella rimutaka,3(1),5(1),15(1),17(3),22(1),26(3),28(1)
33(1),35(2),40(1),44(9),49(1),50(2).Obanella cf rimutaka,29(1),49(1).Paralaoma lateumbilicata,12(6),13(30
16(2),17(10),21(1),22(1),27(1),30(12),32(1),33(2),35(6),48(5),49(18),50(1).Punctid n.sp.1,19(2),22(2),27
(1),30(1),32(1),35(2),42(4),43(2),48(1),49(3),50(1),51(2),55(1).Punctid n.sp.5,5(1),13(4),15(1).Punctid
n.sp.6,5(1),8(2),10(14),12(1),19(5).Punctid n.sp.7,26(4),28(2),37(2),40(1),43(1),55(1).Punctid cf n.sp.7,
32(2),35(2),49(1).Punctid n.sp.8,5(1),6(1),7(2),10(1),14(2),19(1),22(2),23(1),25(1),28(2),29(1),33(1),43
(1),48(1),49(1),50(1),51(1),55(1).Punctid n.sp.17,1(1),20(2),21(1),38(3),42(1),55(2).Punctid n.sp.29,5(2)
7(1),13(26),14(1),15(1),16(2),17(3),19(1),28(4),35(1),36(1),38(1),40(1),42(5),44(5),46(1),47(1),49(3),55
(4).Punctid n.sp.30,21(1),31(1),50(1).Punctid n.sp.32,13(7),16(1),19(1),21(3),26(2),27(2),31(2),35(2),37
(1),38(3),51(1),53(1).Punctid n.sp.33,10(1).Punctid n.sp.40,18(1),26(9),28(2),38(1).Punctid n.sp.43,2(1),
Serpho kivi,13(1),15(1),16(3),20(1),22(2),26(4),27(3),28(1),37(1),44(1),45(2),48(1),50(1).

26(1),44(1).**Punctid n.sp.69**,5(1),46(2),48(2).**Cochlicopa lubrica**,4(8),6(2).**Oxychilus cellarius**,6(2).

<u>SITES WITH A SECURE RESERVE STATUS</u> which have retained bush from earlier days with a largely unmodified snail fauna.

<u>1 Kirks Bush Papakura.</u> This is a level piece of bush, predominantly Taraire but with some Puriri,Rimu,Totara etc.The trees are close together making it quite dark underneath although there is very little undergrowth. There is fairly heavy foot traffic through the trees but the snails don't seem to be particularly threatened.Over the years I have sampled the Reserve several times but the results were remarkably similar This time I collected 4 lts.of litter from several sites all of them more or less thickly covered in Taraire leaves. A very small part of this Reserve lies across the Gt. South Rd. to the east but this portion is just too small to contain anything but **Tornatellinops.**



<u>2.Red Hills Reserve,Papakura,</u>7/9/86. A fairly steep reserve facing east and falling to the stream issuing from the Hunua Gorge. The bush is mixed, with Taraire, Puriri, Rimu and Totara in evidence and a fair bit of fern and scrub in places. I collected 4 litres of litter from the likeliest looking Rimu.

<u>Hunua Gorge</u>,8/84. Steep sided and bushy on the northern side but mostly wasted on the southern with a large quarry and lots of goats. Nevertheless I did my collecting on this side in the best of it because it had easier access. <u>3.</u>2lts taken under Purir <u>4.</u> 2lts under Nikau. <u>5.</u> 2lts from several spots under the general bush.

<u>6. Ponga Rd. Reserve,</u> 13/6/87.. A steep hillside on both sides of the road covered almost exclusively with Taraire and Puriri. I took 6lts of litter from a number of sites including some from under a very rotten log. This is an important site yielding some interesting species I found nowhere else.

<u>7. Olive Davis Reserve, Manurewa,</u> 9/85. A Forest and Bird Society Reserve consisting of a wooded valley with a small stream. There is some lovely regenerating bush on the slopes and ridges but the heart of the reserve is where it is first entered by the stream under some magnificent Puriris. I collected 2 litres of Rimu litter under an old tree bordering these Puriris.

<u>Clevedon Scenic Reserve,</u> 11/85. A large important reserve behind the township, incorporating an old quarry and ascending to the summit of a considerable hill. There are a wide range of trees including large Kauri down to areas of scrub and fern. A considerable river winds around the base of the hill and a flourishing stream bursts out of the quarry. <u>8.</u> 2lts under Taraire and Puriri at the bottom of the eastern ridg <u>9.</u> 2lts under Rimu just below the summit. <u>10.</u> 2lts under Rimu, Puriri and Kauri just above the river at the start of the S.W.ridge. <u>11.</u> 1lt of very fine material from under a large Puririnear the summit on the eastern ridge.

<u>Ngaheretuku Forest and Bird Soc. Reserve</u>, Twilight Rd. Clevedon, 8/85. Regenerating bush with a lot of Rimu and Kauri, nearly joining the Clevedon Reserve.<u>12.</u> 2 Litres of fine litter taken under a very large old Kahikatea down in the valley in a very wet position. This was perhaps the only timber tree to somehow escape the loggers.. <u>13.</u> ½ lt.taken under young Rimu not far from the last site.

<u>Wairoa Gorge Scenic Reserve,</u>10/84. Steep banks on the northern side of the Wairoa River encompassing a side stream. There is a little bush on the southern side alongside the track and some of the main block across the river degenerates into scrub and even grass, but all told this is an important reserve. When I sampled it there were quite a few cattle and sheep wandering through and I wrote to the Dept. of Lands and Survey informing them of this fact. <u>14.</u> Just above the track on the south side under scrubby Tree Fern and Mahoe, 1 litre. <u>15.</u>On the north bank under a large old Kahikatea, 2 lts. <u>16.</u> On the north bank under a prominent grove of Taraire, 2 lts.

<u>Te Morehu Reserve</u> , Kawakawa Bay.Quite a large area of bush mostly regenerating but some of the Puriris look pretty old. On one side of the road it is very steep down to the stream but over the stream the contour is gentler. 8/83 <u>17.</u> 2 litres gathered under Taraire just above the stream on the steep bank.<u>18.</u> 2 lts. of general litter, mostly Puriri, on the upper side of the road. <u>19.</u> again on the upper side of the road 2 litres of fine litter taken amongst the surface roots of an extremely large Puriri.

20. Close to the last under Tawa and Tree Fern, 2 lts.

Mt. William Reserve, Bombay. Mixed bush with groves of Nikau, Taraire and Kauri which looks as though it might have had a chequered career. However, it is now well fenced and seems to still have a full complement of snails. I found the first **Caureopa micro-umbilicata** here. 5/84. 21. Collected on the spot in fallen Nikau fronds. 22. 2 lts. from the track up the western ridge under Kauri. 23. On the Walkway track under large Tawa, 1 lt. 24. On the Walkway track under Matai, 1 lt.

Raventhorpe Scenic Reserve, 31/7/88. On a hill just north of the Bombay Hills containing Taraire, Tawa, Puriri, Rimu and a few Kauri. The top is rounded but the Reserve has some steep gullies. 25. 1 lt. taken under a large Puriri at the summit. 26. 1 lt. taken from the remains of a completely rotted out log. 27. This 4 lts. was taken on 8/10/88 under an old Rimu and an old Rata.

28. Hunter Reserve, Patumahoe. 9/85. A mixed piece of bush around a stream and waterfall, which has obviously been tampered with in the past but because of the rocky nature of the ground has retained its snail species. It is now well fenced and quite secure and I collected 4 lts of litter from several places amongst the rocks.

29. Waitakaruru Scenic Reserve, 11/85. On a steep southern slope above a stream, this bush appears predominantly Tawa , although this 2 lts. of litter I collected under a leafy Rimu beside the stream.

Waiheke Forest and Bird Society Reserve, Onetangi, 29/3/86. Quite a large area of second growth bush surrounding a stream system. Some large Kauris, a lot of Nikaus, groves of Kahikatea, Tree Fern, Ti-tree and a big variety of other trees make this an oasis on an island which has had most of its bush removed. The number of snail species present indicate that fire or animals have not greatly affected the understorey either.

3o. Collected live in Nikau fronds. 31. 2 litres of litter collected under Kahikatea and from a fallen epiphyte. 32. 2 litres collected amongst the Kauri trees at the top of the Reserve.

33. Pratts Rd. Scenic Reserve, 23/10/88. This Reserve has been modified around the edges but has a core that looks untouched though because the adjacent pool and waterfall is quite popular this piece is beginning to get trampled. I took 4 litres of litter fom under a very old Puriri.

34. Mataitai State Forest, Ness Valley, 1/90. A large area of indigenous, cut over bush adjoining the Hunua Catchment. I took 2 lts of litter under some leafy Rimus. I should have perhaps sampled this area more extensively.

TABLE OF SPECIES. (The first figure represents the site, the brackets the number of specimens found there.) **Rhytida dunniae**,2(1).**Rhytida greenwoodi**,9(1),15(3),23(1),24(1),30(2),33(2).**Delos coresia**,1(3),3(9),4(6),5(5),6(5),7(13),10(2),12(2),13(5),16(6),18(1),19(11),20(7),25(3),27(8),28(2),34(4).**Delos cf coresia**,6(2).**Delos jeffreysiana**,14(1),32(2).**Omphalorissa purchasi**,2(10),3(50+),4(9),5(40),9(2),10(7),11(13),12(1),15(10),16(3),25(56),27(7),28(1),29(1).**Cytora cytora**,2(6),3(3),6(17),7(2),8(4),9(2),10(5),11(1),12(1),13(6),16(5),17(4),20(2),22(4),32(1),33(8),34(10).**Cytora hedleyi**,1(5),2(6),6(3),8(6),9(1),10(2),11(1).**Cytora septentrionale**,6(3),20(2),34(1).**Cytora torquilla**,6(1),16(12),25(26),26(2),33(3).**Cytora chiltoni**,6(2).**Liarea egea**,2(10),3(6),4(16),5(9),6(25),7(2),8(4),9(13),10(4),11(3),12(11),13(10),15(4),16(6),17(42),18(44),19(38),20(50),21(1),23(3),24(1),25(3),26(11),27(5),30(2),31(10),32(11),33(8),34(33).**Liarea hochstetteri carinella**,22(1),23(1),28(3).**Tornatellinops novoseelandica**,1(13),2(14),3(3),5(2),6(18),7(11),8(30),9(1),10(5),11(10),12(21),15(16),16(5),17(3),18(1),19(1),22(1),23(3),24(1),25(16),27(50),28(14),29(7),32(6),33(50+)34(1).**Phenacharopa pseudanguicula**,2(1),6(1),8(1),12(1),15(1),25(2),27(2),32(1),34(1).**Charopa coma**,3(3),6(2),7(7),8(12),9(2),12(60),13(1),15(57),17(4),19(2),21(2),22(3),23(3).**Charopa montivaga**,31(1).**Paracharopa chrysaugeia**,6(4),12(18),15(45),20(2),30(4).**Paracharopa fuscosa**,1(3),3(12),4(1),

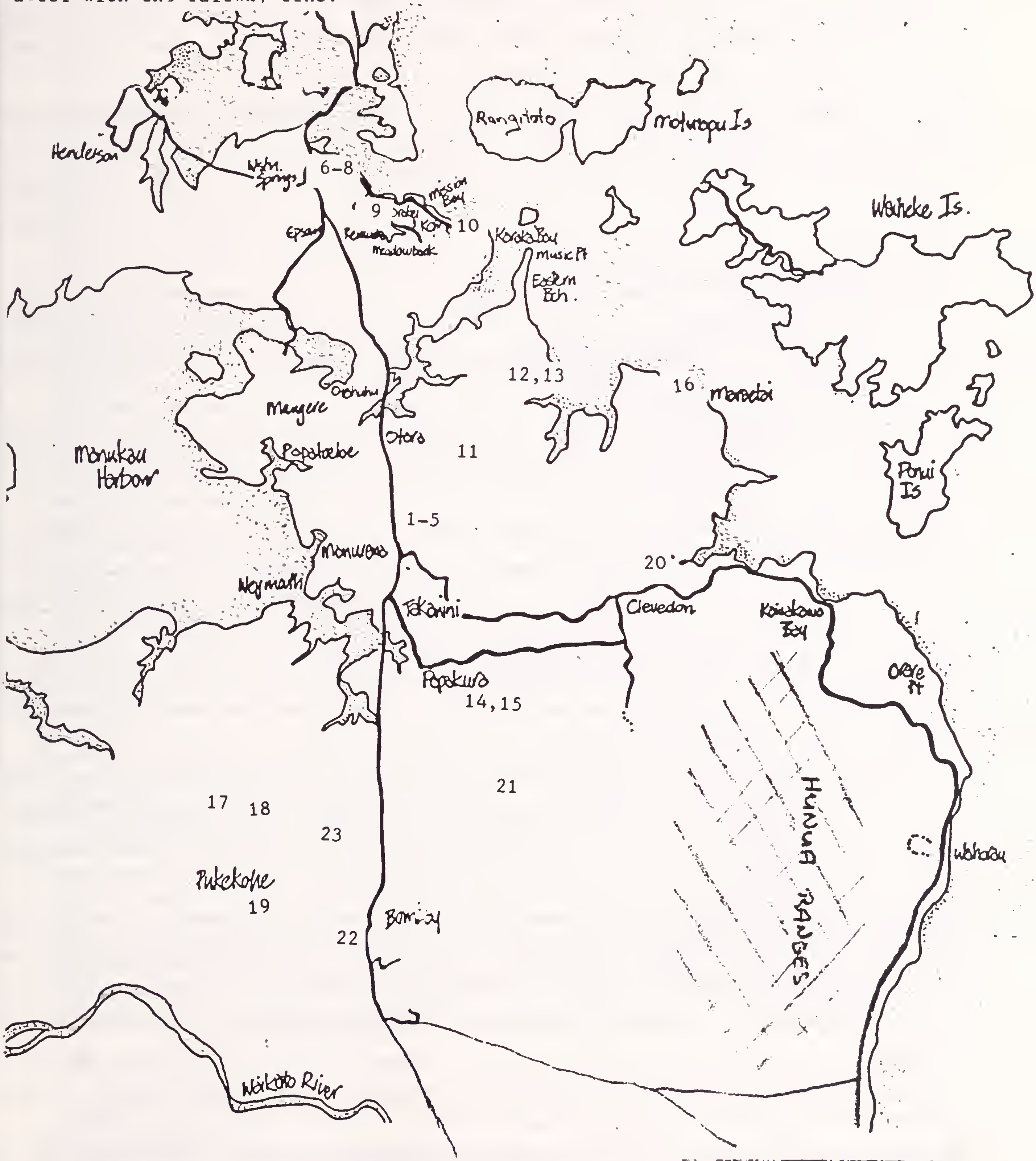
5(2),10(1),12(12),13(1),34(2).**Chaureopa titirangiensis**,12(1),15(2),27(1).**Chaureopa microumbilicata**,7(1), 19(3),21(1),22(1).**Chaureopa hazelwoodi**,6(10).**Charopa pilsbryi**,6(2),7(5),9(1),11(1),12(8),15(16),23(1),27 (2),28(1),33(1).**Huonodon hectori**,2(3),3(2),6(1),7(1),9(1),11(1),12(19),15(55),23(1),31(2).**Huonodon pseudo leioda**,6(16),9(2),10(1),11(5),12(13),15(2),16(1),17(7),19(2),20(6),23(1),25(3),26(18),28(2),31(3),32(8), 33(5),34(2).**Cavellia buccinella**,1(1),3(5),5(1),6(12),8(1),9(8),10(3),12(30),13(2),15(2),18(3),23(1),25(3) 26(1),27(5),30(1),31(1)32(1),33(2).**Cavellia reeftonensis**,2(1),9(1),12(1),23(1),34(1).**Fectola infecta**,2(2 6(1),8(2),11(1),12(11),13(1),15(3),16(1),17(1),18(1),33(7).**Fectola mira**,6(3),14(1).**Fectola unidentata**,8(12(1),13(1),19(15),25(1),28(1),32(1),33(1).**Flammocharopa costulata**,12(1),14(1),22(1),27(2),29(1),33(1). **Flammocharopa cf costulata (a)**,15(1),34(1).**Geminoropa cf cookiana**,2(15),3(3),4(12),5(5),6(44),9(1),10(3) 12(2),15(2),17(4),22(4),25(1),27(1).**Mocella eta**,1(1),2(4),3(20),4(35),5(6),6(6),7(14),8(1),9(4),10(14),1 (12),12(18),15(20),16(1),18(4),19(11),20(6),22(4),23(1),24(4),25(13),26(3),27(15),28(10),30(4),31(16),32 (6),33(50+),34(3).**'Mocella'sp. 3**,2(7),3(2),4(2),5(3),6(7),7(1),10(3),12(60),13(8),15(25),16(3),18(3),19(20(7),21(1),23(2),26(8),27(3),28(12),31(6),32(4),33(1),34(16).**'Mocella"sp.4**,1(4),2(2),4(1),5(2),6(11),7(8(3),9(3),10(1),11(2),12(15),13(5),15(25),23(2),26(2),27(6),28(2),31(1),34(2).**Therasiella celinde**,1(4),2 (3),3(1),4(3),6(40),9(5),12(9),13(12),15(3),18(1),20(1),21(1),22(11),27(16),33(1),**Therasiella tamora**,4(4 6(1),10(1),13(2),17(7),34(1).**Therasiella neozelanica**,1(7),2(3),3(3),7(3),8(3),10(8),11(11),13(6),15(11), 16(1),17(3),20(1),22(1),27(2),28(5),31(1),32(7),33(2).**Therasiella cf neozelanica**,4(6),6(50),12(14),25(6), 26(20),27(7),28(1),33(1),34(17).**Therasiella serrata**,27(2).**Suteria ide**,4(1),6(3),16(1),17(1).**Flammulina chiron**,6(4),21(1),33(1).**Flammulina cornea**,9(2).**Flammulina feredayi**,27(2),34(4).**Flammulina perdita**,2(3),6 (13),7(4),8(6),9(2),10(1),14(3),15(3),17(1),19(5),23(3),27(1),32(5),33(10).**Flammulina crebriflammis**,27(4) **Therasia decidua**,2(1),15(1),17(2),25(3),30(1),32(2).**Serpho kivi**,5(1),6(3),8(2),12(3),15(1),17(2),19(1),2 (2),31(1).**Thalassohelix ziczag**,6(3),9(1),10(1),13(1),16(2),17(1),20(1).30(1),32(1).**Allodiscus dimorphus**, 8(1),20(2),34(1).**Allodiscus miranda**,15(1),20(1),34(1).**Allodiscus planulatus**,6(1),31(1),32(1).**Allodiscus urquharti**,4(1),5(9),6(5),10(2),13(2),16(1),18(3),27(10),28(1),34(1).**Phenacohelix giveni**,1(1),2(1),4(5),6(7(4),8(6),9(3),11(1),12(20),15(20),17(4),18(1),19(4),20(2),23(3),27(5),28(9),30(1),33(16).**Phenacohelix pilula**,2(1),9(3),10(1),11(2),13(1),15(10),21(1),22(1),32(1),33(1).**Laoma leimonias**,1(4),2(11),3(3),4(3),6 (2),7(8),8(4),10(1),11(1),12(7),13(20),15(2),16(4),25(25),26(2),27(2),30(2),31(1),32(10).**Laoma marina**,7(31(1),32(4).**Laoma cf marina**,1(3),3(4),4(7),5(10),6(6),7(3),8(5),9(2),10(4),11(3),12(10),13(5),15(4),16(7) 20(1),22(7),24(2),27(3),28(30).**Laoma pirongiaensis**,2(50+),6(9),15(2),17(2),22(8).**Laoma poecilosticta**,2(2) 7(8),13(10),16(1),22(12),27(2). **Laoma transitans**, 22(1).**Laoma mariae**,2(8),3(3),4(4),5(2),6(16),7(2), 12(3),15(1),19(2),20(2),26(2),27(10).**Phrixgnathus ariel**,2(1),3(2),4(1),5(1),6(1),7(7),8(22),9(3),11(3),12 (5),15(28),16(1),18(1),19(30),24(3),25(1),26(1),28(1),33(30),31(1).**Phrixgnathus conella**,1(4),2(4),3(1),5 (2),6(8),7(1),24(2),25(1),27(2),30(1),33(8),34(1).**Phrixgnathus fulguratus**,2(7),6(5),7(3),8(7),10(1),11(4) 12(11),13(1),14(2),15(6),18(1),19(1),28(1).**Phrixgnathus erigone**,2(26),3(5),4(3),5(4),6(13),7(2),9(1),10(1 12(18),13(3),15(19),17(6),19(1),20(3),21(1),22(4),27(2),31(2),33(5),34(1).**Phrixgnathus lucidus**,2(12),7(1) 8(50),9(19),10(12),11(1),12(1),13(12),28(1),30(1),31(6),32(2),33(1),34(12).**Phrixgnathus cf lucidus**,4(2), 6(14),21(1),22(4).**Phrixgnathus glabriusculus**,4(1),7(1),9(5),12(1),15(2),28(2).**Phrixgnathus serratocostatu** 2(2),3(1),5(1),10(2),25(1),31(2),33(1).**Punctid sp. Ngaheretuku**,12(1).**Punctid n.sp.55**,1(1),2(34),3(2),4(2 5(3),6(2),7(1),9(4),11(8),12(25),15(3),22(1),23(6),25(43),26(2),27(9),34(34).**Pasmaditta jungermanniae**,1(4(1),6(1),7(1),8(14),10(1),15(2),17(1),22(1),27(1),28(1),29(1).**Pasmaditta cf jungermanniae**,8(14).**Pasmadit miserabilis**,4(1),11(1),12(2),25(1),27(2).**Phrixgnathus viridulus**,6(2),26(1).**Obanella rimutaka**,6(4),12(7), 15(5),20(2),23(1),26(1),28(3).**Obanella cf rimutaka**,34(8).**Paralaoma lateumbilicata**,1(2),6(9),12(55),15(2) 20(4),24(2),25(12),28(1),31(6).**Punctid n.sp.1** 6(5),10(1),12(1),13(1).**Punctid n.sp.5** 8(2),15(1).**Punctid n sp.6**,2(18),8(2),10(1),18(1).**Punctid n.sp.7**,22(3),27(1).**Punctid n.sp.8**,3(4),4(2),5(1),6(2),10(1),12(6),15 (1),27(10),28(3),34(1).**Punctid n.sp.17**,6(1).**Punctid n.sp.29**,3(16),4(4),5(12),6(7),9(3),10(2),11(3),12(8) 13(6),15(8),17(2),19(1),25(2),26(2),27(12),28(1),31(1),33(3).**Punctid n.sp.30**,22(1),31(1).**Punctid n.sp.32** 2(2),3(3),6(2),12(1),15(1),31(1).**Punctid n.sp.43**,4(1),9(1).**Potamopyrgus antipodarum**,12(2),27(4).**Cochlicop lubrica**,6(1),14(10),33(*).**Oxychilus cellarius**,6(1),29(1),33(*). * = too many to count.

MODIFIED BUSH IN SECURE RESERVES. These are mostly old farm lots where the trees can be quite magnificent but some have been damaged by other means and the snails greatly modified.

Manurewa Bush Reserves. 1 Walpole St. Reserve, containing Kahikatea and Totara and almost nothing else, 1 litre of litter. 12/84. 2.Hill St. Res. opposite the Nathan Homestead, which is the best of these first three, possibly because it has a small stream. 2 lts. 12/84. 3. Orford Park, 2 lts. 12/84. 4. Totara Park only seems to hav snails at that point closest to the Botanic Gardens. 2 lts. under Kahikatea and Tree Fern 10/87 5. Idesia Place Reserve is similarto several pieces of bush which the developers have left and incorporated into housing estates to improve the attractiveness of the sub-division. 2 lts. from Kahikatea, Totara, Tree Fern, 11/87.

Grafton Gully. I wonder how much longer this poor neglected Reserve can last. When one reads the description of it in Lucy Cranwell's "Botany of Auckland", it is apparent how badly this "jewel without price" has been plundered. It still harbours quite a few native snails which I have placed in this "secure reserve" section more in hope than conviction. 6. 11/85. 2 lts. from Tree Fern, Oak, Cabbage Tree, Mahoe. 7. 8/86, 2 lts. near the bottom of the gully on a very steep bank under Puriri.

Auckland Domain. The bush in the Domain is a great mixture of introduced and native trees, which just about sums up the snails in it as well. How it came by its native snails is a bit of a mystery, though there could always have been a vestige of bush down in the gully somewhere. 8. 8/86, 2 lts. collected along the track running parallel with the railway line.



9. Kepa Reserve, Orakei, 8/85. A steep neglected reserve which looks like having a chequered past and not much future. I took 2 lts. from the top of the reserve under Kawakawa, Kohekohe, Tree Fern and Hawthorn.

10. Dingle Dell, St. Heliers, 14/9/86. I hadn't expected any native species here as I believe this bush has been planted, a labour of love by a dedicated lady. However I was pleasantly surprised to find quite a few natives so there must have been at l a nucleus of bush in the first place. I took 4 lts of litter, collected at several places, but mostly under a big coarse grass which is prominent in the Reserve.

11. Murphy's Bush, Flat Bush Rd. Manukau,11/85. Regenerating Kahikatea is the featu in this beautiful level piece of bush. In November they were in full flower and the litter was covered with fallen blooms. The bush has suffered with animals in the pa but now is well protected, indeed kept in park like condition. I took 4 lts. under Kahikatea and Puriri.

Howick Reserve, 2/8/87. An odd shaped reserve between Litten Rd. and Tanglewood Cres generally surrounding a stream, with scrappy bush and garden plants encroaching from adjoining back yards. Yet it still contains some native snails. 12. 2 lts taken unde Tree Fern, Mahoe and Matipo. 13. 2 lts. taken under a very large Gum on the edge of the Reserve.

Herkts Reserve, Shirley Rd. Papakura. This tiny reserve has some beautiful large Taraire and Kahikatea but is just too small to support more than one native species. From 2 lts of litter I obtained 10 **Tornatellinops novoseelandica**, 1 **Oxychilus cellarius**, 1 **Cochlicopa lubrica.**

14. Gibbs Crescent Reserve, Red Hills, Papakura, 7/9/86.This was a fairly steep piece of bush containing some lovely large Puriris which I didn't properly explore. I collected 2 lts. from a large Rimu.

15. Puke Kiwiriki Pa, Red Hills,7/9/86. A unique hill feature which should never have been built up so closely.There is some good bush here but it has too many people walking through to ever support many snails. I collected 2 lts. of litter at the base of the cliff under Taraire and Kawakawa.

16. Omana Regional Park, 2/85. This very popular seaside reserve has a charming piece of bush alongside a small stream and a pond. I took 2 lts. from several places under Taraire, Totara, Puriri and Kanuka.

17. Paerata Scenic Reserve, 10/85.This is another tiny reserve with beautiful large trees, but considering the traffic through it, not really large enough to support many snails. Wandering Jew which is smothering the ground, does not usually worry native snails much. I collected 2 lts. of Taraire litter.

18.Coulthards Scenic Reserve, between Paerata and Bombay, 10/85.Quite a large area of mature trees but eaten out underneath by animals. It is now fenced but still has little undergrowth. However, with its many Nikau and respectable size this bush may still have retained a reasonable native snail population. I took 4 lts.from a variety of sites.

19. Rooseville Park, Pukekohe, 10/85.Mostly Totara but some Puriri, Kahikatea, Rimu and Pukatea. I took 2 lts. from several sites.

20.Ruato Scenic Reserve, 11/85, just north of Clevedon, beside the main road. The best

of the Reserve surrounds a stream and is quite precipitous. It seems to stretch as a narrow strip some distance along the road but here is covered with Ti-Tree. I collected 2 lts. from quite high above the stream under Kahikatea, Beech and Tawa.

21. Peach Hill Reserve, 8/10/88. Site of the old Maketu Pa, it is very sad that it could not have been better preserved. Although there are some fine Titokis and the view from the top (on private land) is still good, essentially another "priceless jewell" has been lost. The volcanic rocks which form the hill are choked with introduced snails leaving the few native species little room, while Privet is likewise crowding the native trees. I took 2 lts. of fine litter amongst the rocks.

22. Greens Scenic Reserve, Bombay, 21/11/88. A small well fenced piece of bush with some lovely trees, mostly Taraire and Puriri. Although it looks so good and the undergrowth is thick it must have been cleaned out by animals at some time for there are few native snails. I took 1 lt. from several sites.

23. Kern Scenic Reserve, Kern Rd., Ramarama, 13/8/89. One or two hectares running into a damp gully with some large Totara, Kahikatea and Puriri, but it has very little undergrowth and animals have not been long removed. My 2 lts I took from near the bottom of the gully.

TABLE OF SPECIES. **Rhytida greenwoodi**,11(1),20(1).**Delos coresia**,5(2),6(1),7(1),9(10),10(15),11(1),12(10),14(1),16(3),17(2),18(6),19(2),20(2),23(6).**Omphalorissa purchasi**,4(18),11(4),14(1),16(1),18(2),23(5).**Cytora cytora**,2(2),4(2),11(4),16(1),18(2).**Cytora hedleyi**,6(7),11(7),17(2).**Cytora torquilla**,9(3).**Liarea egea**,4(1),6(9),7(1),16(4),17(3),18(3),20(22),23(7).**Liarea hochstetteri carinella**,17(1),18(7).**Tornatellinops novoseelandica**,2(1),3(3),4(25),5(10),8(2),9(3),10(8),11(10),12(9),14(22),15(17),16(18),17(30),18(18),19(3),20(3),21(13),22(2),23(50).**Tornatellides subperforata**,8(2),10(20),12(28),13(1).**Phenacharopa pseudanguicula**,4(2),16(4),19(1).**Charopa coma**,14(3).**Paracharopa chrysaugeia**,12(1).**Paracharopa fuscosa**,2(1).**Egestula egesta**,7(1).**Charopa pilsbryi**,8(1),10(1),14(1),17(1),19(1).**Geminoropa cf cookiana**,9(1),17(4),18(1),20(1).**Mocella eta**,2(15),4(20),5(50+),6(8),7(3),8(24),9(27),10(50),11(33),12(9),14(2),15(10),16(33),17(2),18(2),19(2),21(3),23(19).**'Mocella sp.3"**,11(3),14(4),18(12),20(10).**'Mocella sp.4"**,11(2),14(9),16(3),17(1),21(6),23(1).**Huonodon hectori**,14(3),16(6).**Huonodon pseudoleioda**,2(1),3(1),4(1),6(4),12(11),16(1),18(2),**Cavellia buccinella**,2(1),4(10),5(4),9(11),10(3),11(11),12(1),14(4),15(3),16(10),17(5),18(2),23(2).**Fectola infecta**,9(1),10(13).**Fectola mira**,16(1).**Fectola unidentata**,14(1),15(1),18(2).**Flammocharopa costulata**,20(1),21(5).**Therasiella celinde**,4(3),11(1),12(1),13(1).**Therasiella neozelanica**,2(1),10(4),11(6),14(2),16(9),17(2),18(7),20(2).**Therasiella cf neozelanica**,4(2).**Therasiella tamora**,4(5),14(1),20(6).**Flammulina chiron**,6(1),9(1),13(5)19(1),23(1).**Flammulina perdita**,4(3),9(4),11(2),14(3),15(1),16(1),17(1),18(4),19(6),20(15)21(4),22(1).**Suteria ide**,6(4).**Therasia decidua**,3(1),6(1),10(1),11(1),12(2),13(1),16(1),17(2).**Thalassohelix ziczag**,6(3),7(10),18(3),22(1).**Allodiscus urquharti**,4(3),17(13).**Phenacohelix giveni**,5(2),6(2),8(7),9(3),10(8),11(2),12(4),13(6),14(2),15(7),16(5),18(8),21(16),23(8).**Phenacohelix pilula**,10(3),15(4),21(1).**Phenacohelix cf pilula**,17(1).**Laoma leimonias**,2(2),3(1),9(8),10(2),14(5),17(4),18(4),20(7).**Laoma marina**,19(4).**Laoma cf marina**,20(6).**Laoma cf marina (a)**,4(8).**Laoma poecilosticta**,4(9),6(1),10(11),11(13).**Phrixgnathus ariel**,3(1),4(5),7(1),10(2),11(4),14(14),18(3),18(2),20(6),21(41),22(1),23(1).**Phrixgnathus cf ariel**,16(3).**Phrixgnathus conella**,3(1),4(1),5(8),8(10),9(12),11(1),12(4),15(7),16(2),17(1),19(1).**Phrixgnathus fulguratus**,4(18),6(2),11(10),14(1),20(2).**Phrixgnathus erigone**,4(3),6(5),8(9),9(2),10(23),14(1),15(2),16(1),20(2),21(2),23(3).**Phrixgnathus lucidus**,20(3).**Punctid n.sp.55**,2(5),4(3),12(50).**Pasmaditta jungermanniae**,4(3),15(3),17(1),19(1).**Pasmaditta miserabilis**,4(2).**Phrixgnathus serratocostatus**,2(1),4(4),19(2).**Obanella rimutaka**,16(4).**Paralaoma lateumbilicata**,1(12),4(2),5(20),8(12),9(25),10(35),11(6),12(9),13(4),16(27),18(8),19(3).**Paralaoma caputspinulae**,13(4),15(2),16(3).**Punctid n.sp.5**,9(1).**Punctid n.sp.6**,6(1).**Punctid n.sp.7**.19(1).**Punctid n.sp. cf 7**,20(1).**Punctid n.sp.8**,4(1),16(6).**Punctid n.sp.29**,2(5),3(5),4(14),6(1),9(5),10(7),11(2),12(6),15(1),16(4),17(2),18(1).**Punctid n.sp.30**,19(1).**Punctid n.sp.32**,6(1).**Punctid n.sp.38**,8(6),10(1).**Punctid n.sp.40**,20(4).**Punctid n.sp.43**,13(3).**Cochlicopa lubrica**,5(4),8(40),9(6),11(3),12(15),13(20),15(20),18(1),21(*).**Oxychilus cellarius**,5(3),6(3),8(13),9(6),11(1),13(4),15(10),21(*).**Vallonia excentrica**,13(20).**Lauria cylindracea**,13(1).**Vertigo ovata**,8(1).**Vitrea crystallina**,8(13).**Serpho kivi**,14(1),18(2),20(2).

THREATENED SITES. 1. Mt. Eden, 3/3/87. A small rocky reseve at the base of the hill in Mt. Eden Rd. coll. by B.F.Hazelwood.

2. Mt. Wellington crater in amongst scoria, 3/3/87, coll. by B.F.Hazelwood.

3. Cornwall Park, in rock walls covered with ivy, 7/87.

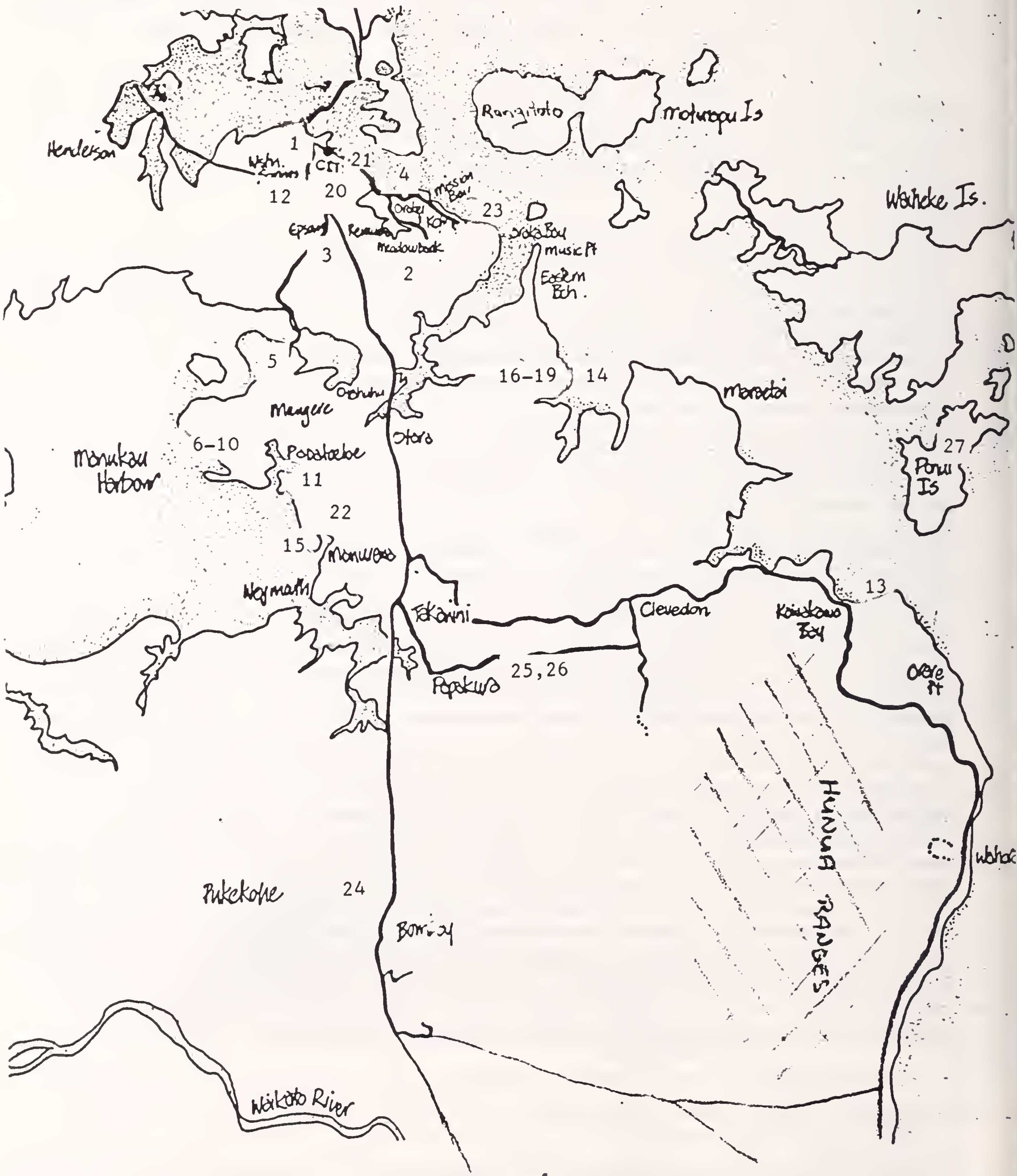
4. Okahu Bay, under Toetoe

5. Mangere Mt. crater, collected over a long period in scoria covered with mühlenbeckia

6. Ihumatao, in front of Ellet's Mt.in coastal rocks, 10/83. 7. 200 metres to the east under Pohutukawas, 10/83. 8. Further east still, opposite the Airport runway iin a strip I have called Kirkbrides Bush as it fronted their farm and they were responsible for preserving it.(though they have just now sold it.). This collection was from the eastern sector which is Mahoe and Tree Fern mostly, 10/83. 9. Kirkbrides Bush west, which comprises large Pohutukawas with Kawakawa underneath. 10 . Kirkbrides Bush, a 1977 collection.

11. Papatoetoe, on the banks of the stream behind the crematorium.

12. Almorah Rd.,Mt Eden. A very fine stand of Titoki and Puriri mainly on very rocky ground. I thought this was private bush but have recently found that there is indeed a reserve running through it. It is thick with native snails but species are some-



what sparse.I took 3 litres of Puriri litter.

13. Waiti Beach, Kawakawa Bay, under Pohutukawa, Matipo and hook grass.

14. Shelley Park, Howick, 2/8/87. On a steep track leading down to the boat yard and estuary I took 2 litres mostly under Mahoe and Kawakawa. It was a promising site but had few snails and probably has been burnt off in the past.

15. Wiri Swamp, 7/87. A natural swamp behind a beach just opposite the L.P.G. terminal. It is fringed by Ti-tree but animals have had long access and few snails remain. The swamp itself has some very tall rushes, quite difficult to push through, but apart from an Athoracophorus slug, I found no snails in it. However, at the northern end of the swamp there are quite a few Cabbage trees which have made little islands around their base and here there is a rich snail fauna.

16. 43 Point View Drive, Howick. This is a private bush at the back of about three properties. There is a small Reserve but this is covered in weeds. The private bush at its centre is very good and would greatly enhance the indifferent Reserve for it contains many attractive Nikau. This lot I collected live from Nikau fronds, 28/9/87.

17. 2 litres from under a large old Rimu, perhaps the oldest tree in the bush.

18. 2 lts. under Taraire on a very steep bank. 19. 2lts. under young Rimu on the edge of the bush.

20. Ayr St. Reserve, Parnell, 25/10/87. A valley descending from St. Mary's Cathedral to Hobson Bay, mostly full of introduced trees and weeds but there is some Mahoe and Tree Fern. Icollected 4 lts of litter under the Tree Fern, Mahoe and some Privet. This Privet seemed attractive to lots of **Charopa pilsbryi.**

21. Orakei. 25/10/87. Coastal cliffs between Paratai Drive and Ngapipi Rd. under Pohutukawa, Mahoe and Kawakawa.

22. Wiri Mt., 11/87. Behind the mountain in some coastal rocks. Rocks and rock walls abound in this area but they are singularly devoid of any snails at all.

23. Ladies Bay, 11/87. The steep cliffs behind the beach growing large Pohutukawa with Mahoe, Kawakawa small ferns and lots of introduced flowers and weeds.

24. Raventhorp, 13/7/88. A piece of bush on private land nearly adjoining the Raventhorp Scenic Reserve. It has been extensively grazed but it is now well fenced and the owners, N.M. & P.A.Officer intend keeping it as a bush reserve.

25. Ardmore Quarry Rd. 9/88.This is a rough area of scrub and stream administered, I believe by the Defence Dept. However, there is one or two small areas of very good bush alongside the road worthy of preservation and from this one I took 4 lts.under Kahikatea and Puriri. 26. 2 lts. from further down the road in regenerating bush under a young leafy Rimu.

27. Ponui Is. I received these snails from Martin Walker, 10/89. The labels read, "by the big Kauri, central Ponui, 29/11/71." I presume they were collected by his father, Jock Walker, and as I haven't visited the island have felt it worth recording in this report. This record includes the only **moellendorffi** I have seen on this survey.

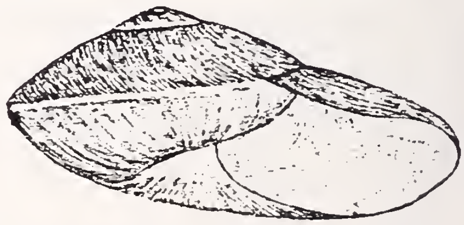
28. Duder's Bush, between Clevedon and Maraetai,11/3/90.This is a considerable area of private bush belonging to Brian Duder, 32 hectares I believe, which is only threatened in the sense that it is not a Reserve. Indeed it is very well looked after and

although it was logged many years ago it has retained its full quota of snails. Thi first lot of 2 lts. of litter was taken under Kahikatea near the house and contain large numbers of **Mocella eta** indicating some severe disturbance in the past, but th second lot, 29. 6 lts. taken largely under Rimu in the main valley some distance away, was very productive.

TABLE OF SPECIES. **Rhytida greenwoodi**,14(1),17(1),18(1).**Delos coresia**,6(1),8(*),9(*) 10(6),12(20),15(20),16(1),17(4),19(2),24(1),25(15),26(5),28(3),29(12).**Omphalorissa purchasi**,12(2).**Cytora cytora**,10(1),17(1),18(1),26(7),27(18),29(23).**Cytora hedleyi**,26(3),27(1),29(3).**Cytc septentrionale**,27(3).**Liarea egea**,12(81),13(2),17(2),18(3),19(1),25(6),27(30),28(1),29(*).**Tornatellinops novoseelandica**,1(1),3(*),4(14),5(4),6(*),7(*),8(*),9(*),11(8),12(31),13(3),14(3),15(26),17(4),18(4),19(: 20(12),21(3),24(10),25(75),26(7),29(14).**Tornatellides subperforata**,6(*),7(*),11(3),14(10),20(8),21(6). **Phenacharopa pseudanguicula**,25(4).**Charopa coma**,14(1),16(4),17(7),24(3),25(13),27(1).**Charopa pilsbryi**,8(: 20(20),24(3),25(7).**Paracharopa fuscosa**,17(1),25(1),29(3).**Chaureopa microumbilicata**,29(1).**Geminoropa cf cookiana**,18(2),19(2).**Mocella eta**,5(3),6(*),7(*),8(*),9(*),10(8),11(6),12(33),13(16),14(10),15(45),16(1), 18(4),19(1),20(29),24(8),25(2),26(3),28(*),29(*).**'Mocella' sp. 1**,17(1),29(1).**'Mocella' sp. 3**,2(1),5(3),8 9(1),10(2),12(3),14(1),15(10),17(4),25(26),27(3),29(11).**'Mocella' sp. 4**,5(1),6(1),8(1),15(4),25(5),27(1) 29(7),**Huonodon hectori**,13(12),17(3),25(6),27(1).**Huonodon pseudoleioda**,17(1),18(1),27(7),28(2),29(9).**Cave lia buccinella**,8(1),14(14),15(2),17(2),19(1),24(43),25(7),28(1),29(16).**Cavellia reeftonensis**,27(1),29(1) **Fectola infecta**,12(1),25(2).**Fectola mira**,6(1),25(2).**Fectola unidentata**,17(2),25(3),29(1).**Therasiella cel inde**,17(4),26(4),27(2),29(21).**Therasiella neozelanica**,15(2),17(10),19(4),26(8),27(2),29(16).**Therasiella neozelanica**,12(4),17(1),25(8),29(10).**Therasiella serrata**,17(9),29(11).**Flammulina chiron**,15(3),16(1),20(1 **Flammulina perdita**,9(1),10(3),14(2),16(10),18(1),24(1),25(12),26(2),29(3).**Suteria ide**,12(20),17(1).**Thera decidua**,8(*),10(*),24(2).**Serpho kivi**,16(1),17(2),25(5),27(3),29(10).**Thalassohelix ziczag**,8(*),10(*),12(1 15(18),16(1),27(3).**Allodiscus dimorphus**,16(1).**Allodiscus planulatus**,15(3).**Allodiscus urquharti**,17(1),18(19(1),24(1),25(1),26(2),29(5).**Phenacohelix giveni**,1(1),6(1),7(*),9(1),10(8),11(8),12(1),14(3),15(10),17(20(11),22(1),24(20),25(40),29(1).**Phenacohelix ponsonbyi**,5(15),22(3).**Phenacohelix pilula**,5(3),17(3),20(2) 29(4).**Laoma leimonias**,12(3),17(1),18(4),19(4),24(3),26(2),27(11),29(23).**Laoma marina**,19(2).**Laoma cf mari** 17(1),18(6).**Laoma poecilosticta**,8(*),9(*),10(3),17(9),18(5),19(2),27(1),29(1).**Laoma mariae**,15(14),27(2). **Phrixgnathus ariel**,24(5),25(11),27(4).**Phrixgnathus cf ariel**,2(1),6(*),7(*),8(*),9(*),10(*),13(70),21(11) 23(6).**Phrixgnathus conella**,10(1),12(21),15(28),17(3),18(2),19(2),20(6),24(1),25(10),27(2).**Phrixgnathus fulguratus**,17(3),25(8),26(4),27(1),29(10).**Phrixgnathus erigone**,12(8),14(4),15(16),20(27),25(12),26(1),28 29(4).**Phrixgnathus lucidus**,4(1),14(4),25(2),27(1).**Phrixgnathus glabriusculus**,25(8).**Phrixgnathus moellendorffi**,27(3).**Punctid n.sp.55**,17(7),25(18).**Punctid cf n.sp.55**,20(7).**Pasmaditta jungermanniae**,25(4).**Pasmaditta miserabilis**,25(1).**Phrixgnathus serratocostatus**,25(1).**Phrixgnathus viridulus**,29(1).**Obanella rimutak** 25(1).**Paralaoma lateumbilicata**,10(1),13(30),14(3),19(2),21(1),23(1),29(5).**Paralaoma caputspinulae**,1(1),3 (*),5(30),6(*),7(*),8(*),9(*),13(15),14(1),21(3),23(2).**Punctid n.sp.1**,29(1).**Punctid n.sp.6**,17(1).**Punctid n.sp.7**,26(1).**Punctid n.sp.cf 7**,29(3).**Punctid n.sp.8**,26(2),29(1).**Punctid n.sp.29**,8(1),9(2),12(1),13(4),14 15(20),17(3),18(2),19(6),23(2),24(1),25(8),29(10).**Punctid n.sp.32**,8(1).**Punctid n.sp.40**,29(1).**Punctid n.s** 43,15(3).**Potamopyrgus antipodarum**,14(1),15(3).**Cochlicopa lubrica**,1(1),3(*),5(10),13(50),14(*),16(3),19(5 21(30),23(3),24(25).**Oxychilus cellarius**,1(1),4(4),5(3),13(6),14(2),16(2),21(*),24(6),29(1).**Helix aspersa** 1(1).**Vallonia excentrica**,4(1),5(2).**Lauria cylindracea**,1(1),11(3).**Vitrea crystallina**,21(1).

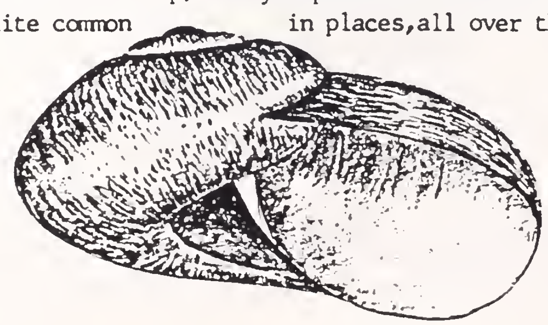
ILLUSTRATION OF SPECIES.

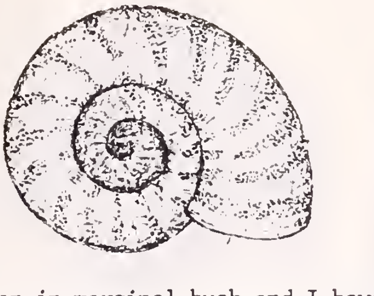
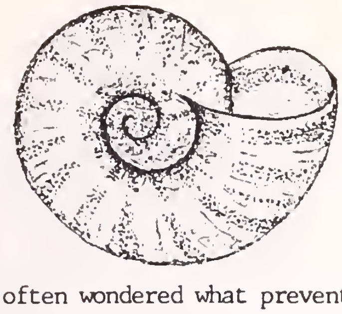
Rhytida dunniae (Gray). 1.9 x 1.0 cm. Found only around the Hunua Gorge, and as the bush is deteriorating here, it is now quite scarce. →



An adult specimen is very hard to find but juveniles seem more plentiful, though becau the eastern side of the Gorge is so steep and inaccessible in places, they may be relatively safe. juvenile, 1.2 x 0.6 c

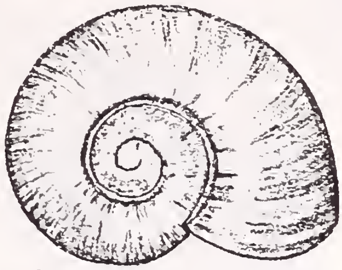
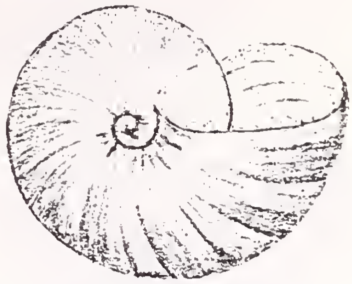
Rhytida greenwoodi greenwoodi (Gray). 2.1 x 1.3 cm. Wairoa Gorge. When collecting is done mostly by litter samples these big snails don't often turn up, but my impression is that this species is quite common in places, all over the region.



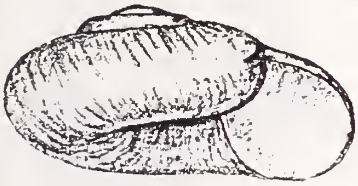
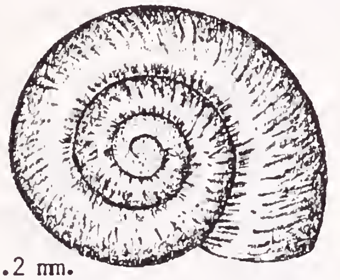
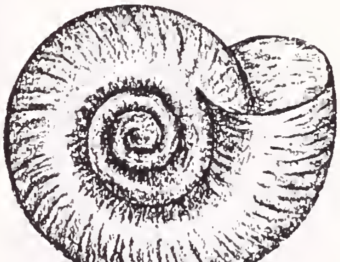
Delos coresia (Gray). Hunua Gorge
3 x 1.5 mm.

This small carnivore is very common even in marginal bush and I have often wondered what prevented it making the jump to garden or pasture, where suitable prey would surely abound.

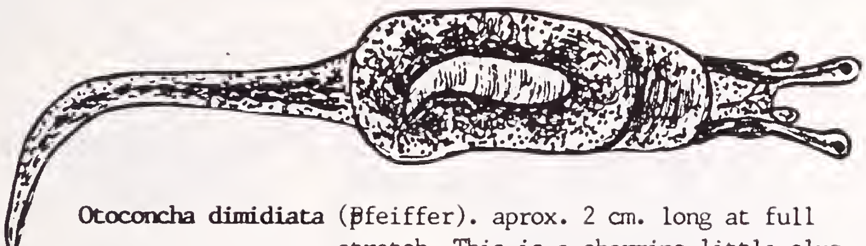
Delos cf coresia. Ponga Rd. Reserve
3 x 1.4 mm.

I have just seen a partial description of this snail by D. Roscoe (N.Z. Journ. of Zoology 1989, Vol. 16, pp 757–761). He has linked it with **Prolesophanta**, Tasmania and shows it with a fairly wide distribution in the lower North Island, both fossil and recent. It was present at Ponga Rd. with **coresia** and is quite distinctive with its flat shallow umbilicus.

Delos jeffreysiana (Pfeiffer),
Mangatawhiri, 7 x 3.2 mm.

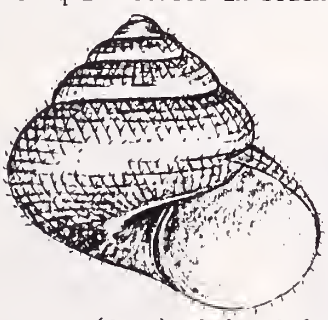
An uncommon snail in this area easily recognised by its large shell and wide umbilicus. None of the shells I found had any pronounced colour pattern though because I saw so few this may not be a regular feature of all shells in the area.



Otoconcha dimidiata (Pfeiffer). aprox. 2 cm. long at full stretch. This is a charming little slug with a vestigal shell just visible. It rests with its tail curled around its body and it is very hard to see, though when disturbed moves quite violently. It dies quickly if taken out of its environment and I never collect it, for I think its quite scarce in South Auckland.

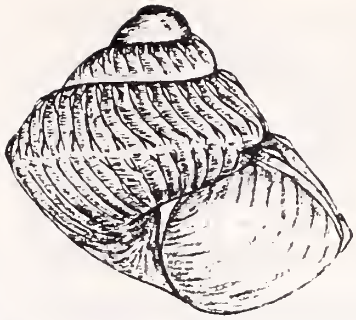
Omphalorissa purchasi (Pfeiffer)
1.2 x 1.8 mm.

Hunua Gorge. An operculate snail which is often present in large numbers. In very wet dark positions it can be the only snail found, though it doesn't necessarily demand these sort of conditions. In some locations the shell can be quite orange.



Cytora cytora (Gray). 2.6 x 2.6 mm.
Wairoa Gorge. This snail tended to be more in evidence than **hedleyi**, but in the Waitakeres the opposite is the case. For some reason I link the two, perhaps because they have the same shape.

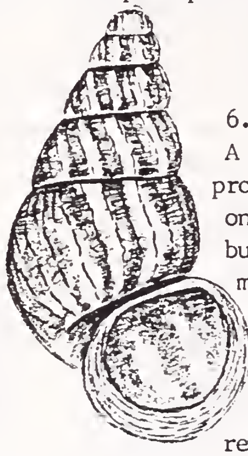
Cytora hedleyi (Suter). Kirks Bush, Papakura, 2 x 2.2mm.
With its plates all intact this is a very lovely shell.

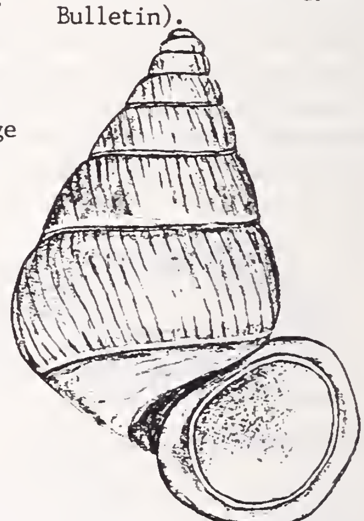


Cytora septentrionale (Suter).

3.5 x 4.5 mm. the juvenile 1.9 x 1.9 mm. Mangatawhiri.
The most prominent **cytora** in the region not through numbers perhaps but size. The juveniles are quite angled on the body whorl which can make them hard to identify. I didn't find it in the Waitakeres so perhaps it is replacing **pallida**. here.

Cytora chiltoni (Suter).
juv. 1.2 x 1.3 mm.
Ponga Rd. Res. I couldn't swear to this for I only found the one and a juvenile at that, but the species is recorded from Hunua. (Gardner July 1979, Conchology Sect. Bulletin).





Cytora torquilla (Suter).
1.3 x 2.1 mm.
Wairoa Gorge. The type specimen is recorded from Howick but the species does not appear to be prolific anywhere in the area. I believe at the Poor Knights Is. huge numbers are living under Pohutukawa (Climo pers comm).

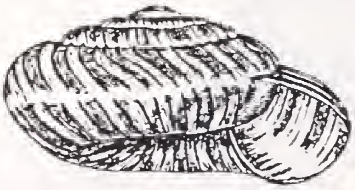
Liarea egea (Gray).

6.5 x 3.5 mm. Hunua Gorge
A species which is very prominent particularly on the outskirts of the bush. I have a Rimu in my garden under which I have introduced **egea**. However, it is only just hanging on and new generations remain very small.

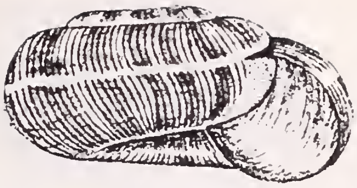
Liarea hochstetteri carinella
(L. Pfeiffer) 7 x 4.5 mm. Almost missing from the survey area and only appearing in the west.
This specimen was from Coulthards Scenic Reserve.

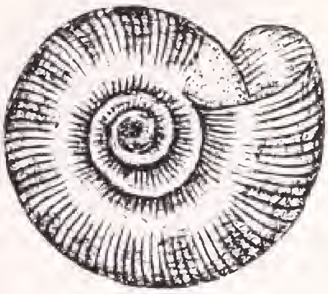
Tornatellinops novoseelandica
(Pfeiffer).
1.2 x 2.8 mm. Kirkbrides Bush
Perhaps our most successful native though it is not really at home in deep bush.

Tornatellides subperforata
(Suter).
3.7 x 2 mm. Ihuamatao
A purely coastal species which can nevertheless exist in large colonies on quite arid ground. It can be separated quite readily from **Tornatellinops**, with whom it often lives, by its narrowly open umbilicus.



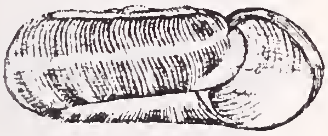
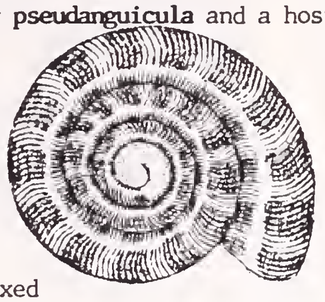
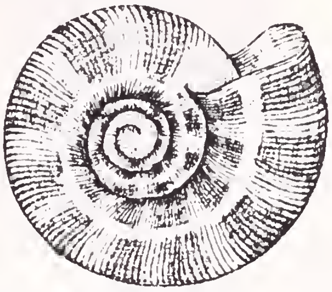
Charopa coma (Gray) 5 x 2.4 mm Wairoa Gorge
A prominent species occuring throughout New Zealand at times in very large numbers.
I have noticed it shows a preference for living under the peeling bark of rotting logs and can almost take over this sort of habitat to the exclusion of other snails.





Phenacharopa pseudanguicula (Iredale).

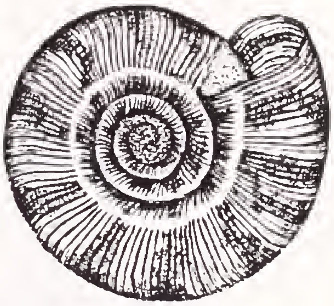
1.7 x 0.8 mm. Omana Regional Park.
Found throughout New Zealand, it also likes to live under bark.
For these under bark dwellers on fallen rotting trunks Rimu is their pre-eminent choice for its bark lifts cleanly away from the trunk in vast strips. The living Rimu also sheds a lot of bark and these fallen chips can also harbour **pseudanguicula** and a host of other snails.

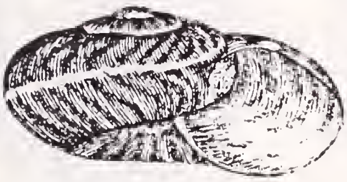
Phenacharopa cf pseudanguicula

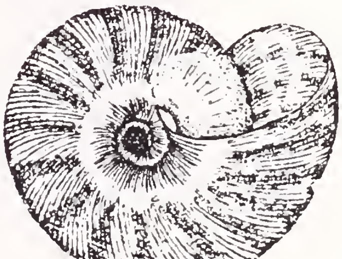
1.9 x 0.8 mm Moumoukai - Waharau track under Rimu. These two can easily get mixed as indeed they have until fairly recently.
cf pseudanguicula has a flat shell, the spire but little raised, slightly wider umbilicus and finer ribbing.It appears to be quite rare in South Auckland.



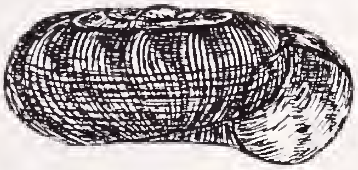
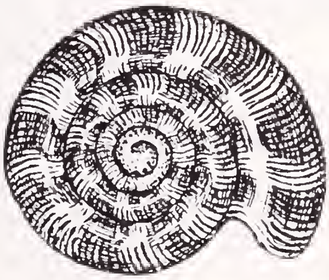
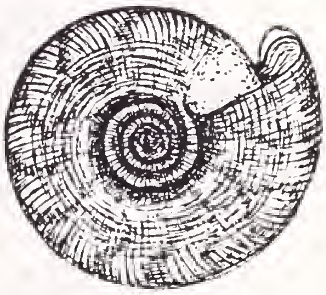


Charopa montivaga (Suter), 'wandering over the mountains' L.
Waharau Rata, 2.9 x 1.2 mm. A larger looser coiled shell than the previous two which I always identify it by its swept back ribbing. As its name might imply it always seems a highly mobile snail, out and running in damp weather.

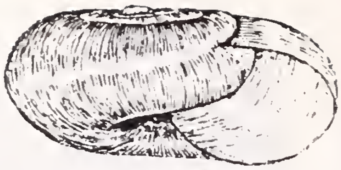
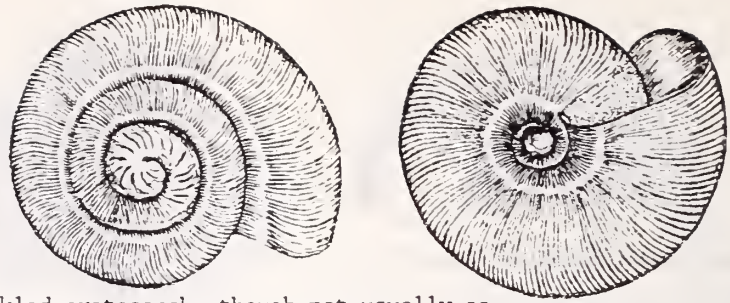




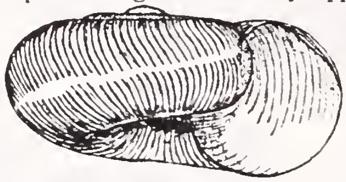
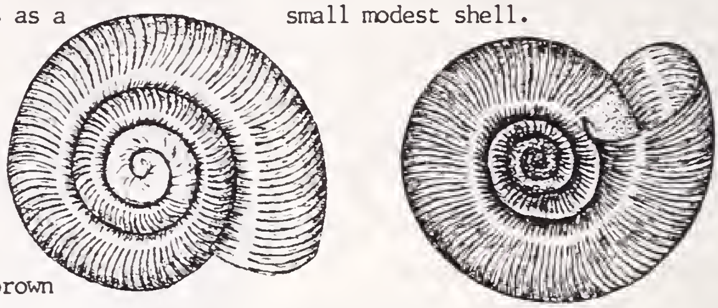
Charopa pilsbryi (Suter).
Wairoa Gorge 2.4 x 1.0 mm
A distinctive umbilicus is the hallmark of this fairly common snail and sometimes the brown zigzag colour pattern on the lighter base can be very striking. In some parts of the country this is regarded as a very hardy snail like **Mocella eta** but in South Auckland it looks more vulnerable.

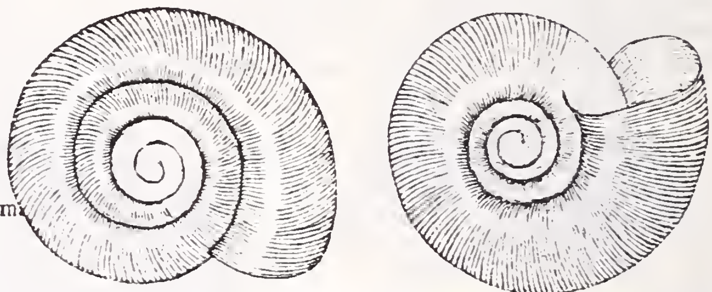
Pseudegestula transenna (Suter),
2.2 x 1 mm Wairoa Dam
An Auckland species, not very common, which I have also collected at Great Barrier Is.
It is certainly not common in South Auckland as I only have it from one spot. More often than not circular lines on the base, or a hint of them, gives this shell away.

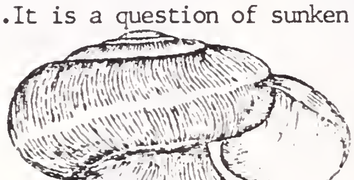
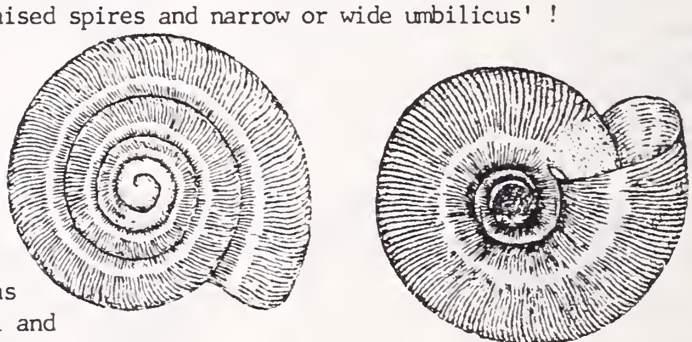
Paracharopa chrysaugeia (Webster).
1.9 x 0.9 mm.
Waharau Regional Park. A plain brown fine ribbed shell with a faintly wrinkled protoconch, though not usually as pronounced as in the one I have drawn. I often have trouble identifying this shell as at times it can grow quite large but mostly appears as a small modest shell.

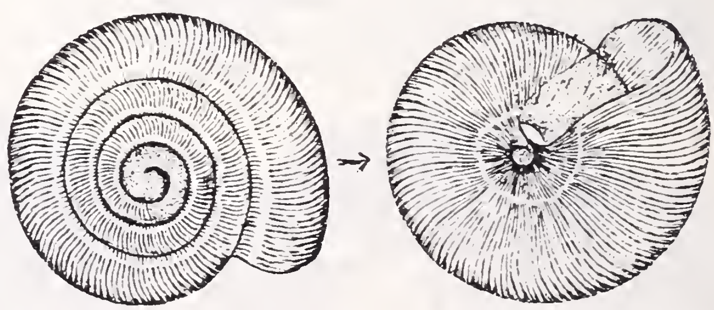
Paracharopa fuscosa (Suter).
1.8 x 0.8 mm Kirks Bush, Papakura. A lovely rich, red - brown shell with clear widish swept back ribs.It seems to like Taraire and its colour is a perfect match for the dead wet leaves of that tree.It is prominent in Kirks Bush where Taraire is abundant.

Chaureopa hazelwoodi Climo 3.2 x 1.4 mm.
Ponga Rd. Res.
I couldn't decide between this species and **Chaureopa subdepressa** Climo for these specimens for they seem to fall halfway between. This is a problem with **Chaureopa** especially around Auckland where several groups converge.It is a question of sunken or raised spires and narrow or wide umbilicus' !

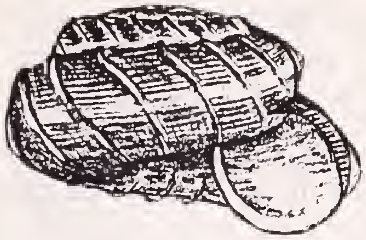
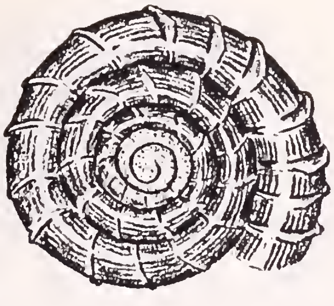
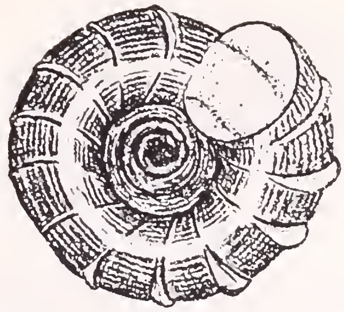



Chaureopa titirangiensis (Suter).
3.4 x 1.8 mm.
Wairoa Gorge.The specimen illustrated has a narrower umbilicus than a typical shell and this used to be called **ochra** but there was never any real demarkation.
All the members of the genus are light straw coloured shells with large smooth protoconchs, on the whole easy to identify, though there could still be one too many species in the present setup.

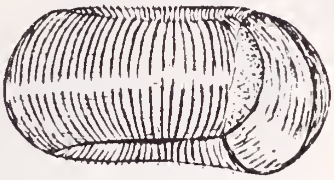
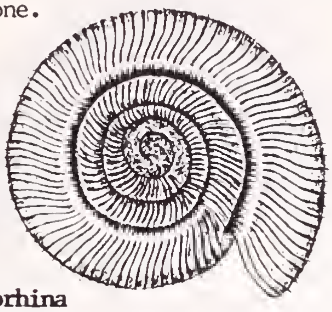
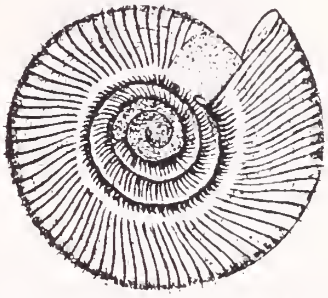
Chaureopa microumbilicata Climo
3 x 1.5 mm
Moumoukai Hill Rd.

As the umbilicus closes the spire gets higher. At the other end of the **Chaureopa** spectrum is **depressa** with a sunken spire and a very wide umbilicus (found in the Bay of Plenty). The shell on the left which comes from Duder's Bush, Clevedon (3 mm wide) is an example of an umbilicus which doesn't comfortably fit with any of the species parameters, though the shell looks like **microumbilicata.**

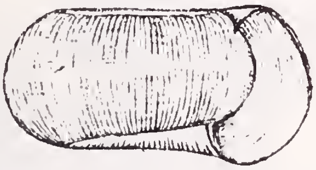
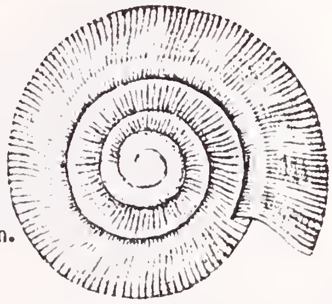
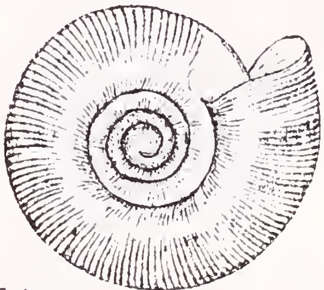
Egestula egesta (Gray). 3.6 x 2.5 mm.
Grafton Gully.

When this snail has all its shell processes intact and it is not covered in dirt it is a remarkable sight. Sadly it is not really a South Auckland species as I have only found it in Grafton Gully and its days are numbered there, in fact it may even now be gone. Rumour had it that it was prolific at Almorah Rd. but I failed to find even one.

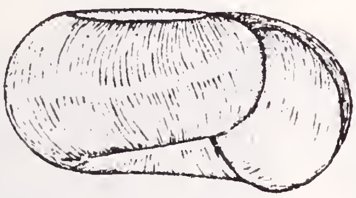
Geminoropa cf cookiana (Dell).
1.5 x 0.8 mm.

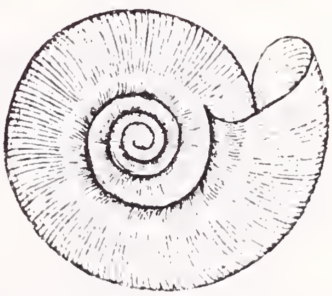
Te Morehu Reserve . I named this **Microrhina** in the Waitakere report and it is the common one around Auckland, relative to the other two of course, which are quite rare. Younger specimens are glistening white and stand out well from the dark litter even though so small.

Geminoropa vortex (Murdoch) 1.5 x 0.8 mm.
Kohukohunui in moss.

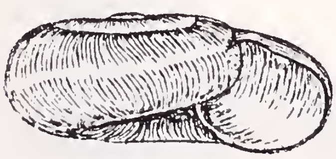
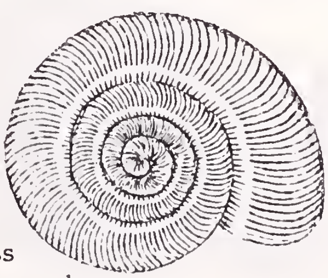
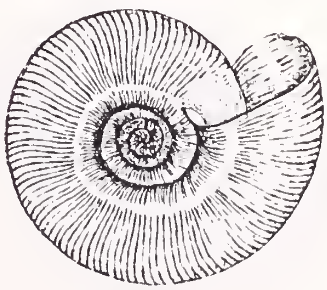
A fairly wide ranging snail but I have never found other than one or two specimens at a time.It often has a faint colour pattern which can help separate it from the other two.





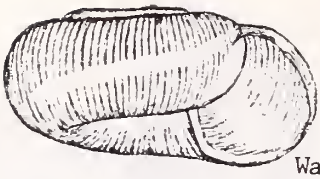
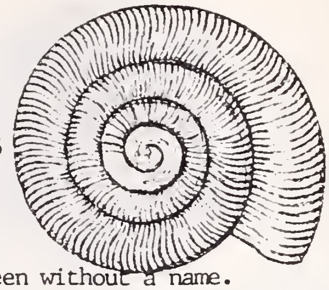
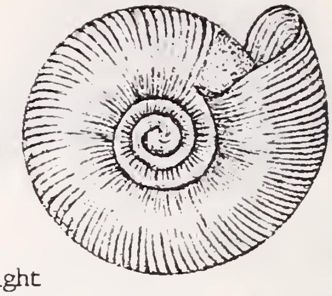
Geminoropa huttoni (Suter).
3.7 x 2.8 mm

Kohukohunui in moss. By far the largest of the three this snail has a lovely white, delicate shell. I think this is a snail requiring a fairly damp habitat and I only found it on the misty Kohukohunui. This may be its most northern siting though it may reach a little further on the Coromandel heights.

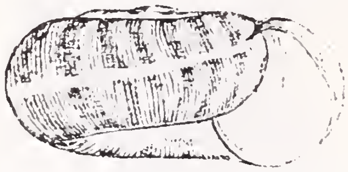
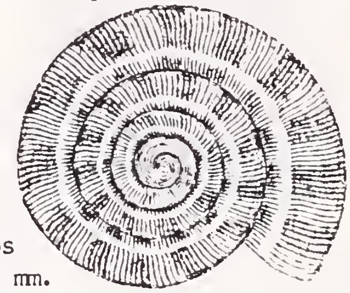
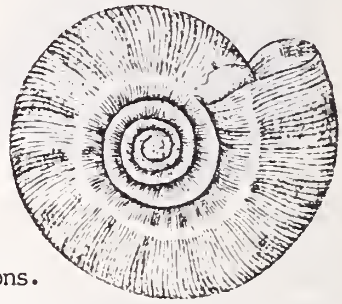
Mocella eta (Pfeiffer). 2.5 x 1.2 mm.
Hunua Gorge.

A very successful snail which nevertheless just falls short of making the transition to the home garden or the farm. Mostly pure white often straw coloured I have on occasion seen one that was properly brown.Other features of the shell though remain very constant and it is probably the lot of these prolific species to remain so.

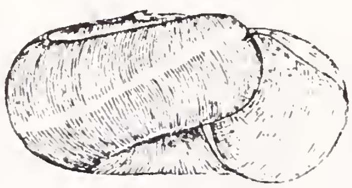
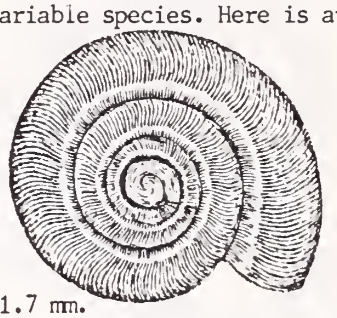
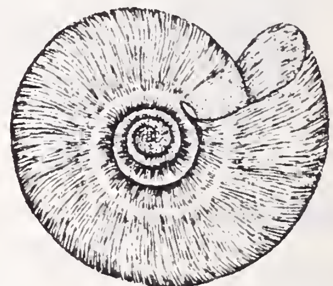




2.75x1.75
Waharau

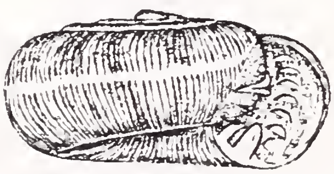
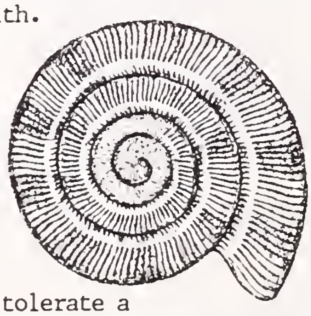
'Mocella'sp 1 Since Dr. Climo took the name **Mocella** for what used to be **Subfectola** this group has been without a name. In the same way that **Chaureopa** is difficult to pin down into watertight species **'Mocella'**is more so. I am sticking with just the three basic species for this area, based on general shell features rather than the more fashionable protoconch details. This one then has a lightish coloured shell, somewhat square in profile and coarser ribs than the other two.

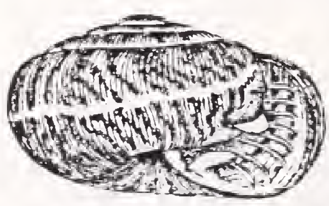
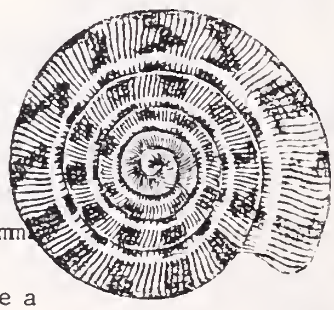
'Mocella' sp. 3. The close-ribbed coloured one, perhaps the hardiest and commonest. 2.5 x 1.3 mm. Ruato Sc. Res. Individual locations can produce some strange variations. Ponui Is. specimens are quite domed and some from Mataitai Forest have very wide radial ribs at the end of the protoconch spirals and before the true ribs start. Perhaps **sp. 1** and **sp. 3** are two extremes of a variable species. Here is an interesting conundrum to be solved.

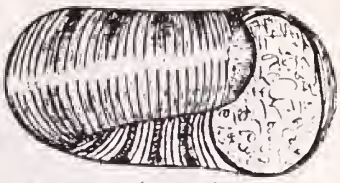
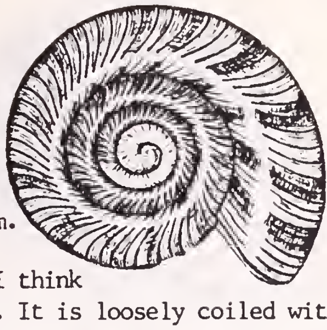
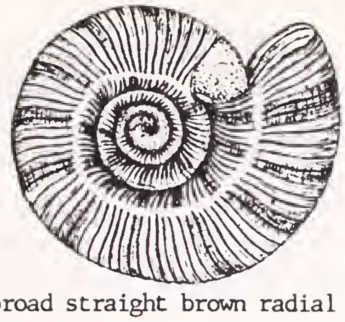
'Mocella ' sp. 4. This one at least is quite distinct.3.2 x 1.7 mm. Waharau. Very fine ribs distinguish this shell which is relatively large, without a colour pattern, and living in the right condions indeed does look very distinguished. Even with this species though the shell varies greatly with differing conditions, though always keeping the fine ribs to recognise it with.


Huonodon hectori (Suter).1.8 x 0.9 mm. Wairoa Gorge. Found throughout New Zealand **hectori** can also tolerate a coastal situation with a degree of salt spray. It is really more prominent further south but still manages a reasonable presence in Auckland.

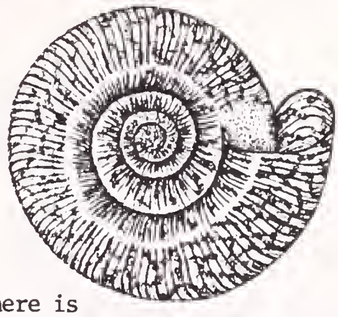

Huonodon pseudoleioda (Suter).2.4 x 1.3mm. Wairoa Gorge. A compact solid looking shell with quite a glossy surface. I primarily think of it as a snail that is tolerant of Beech litter, which most small snails are not. Strangely, it does not get down as far as the main South Island Beech forests where one would suppose it would have a real advantage.

Cavellia anguicula (Reeve). 3.2 x 1.7 mm.
Waharau, Pukatea.

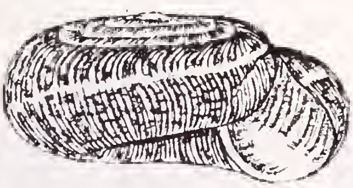
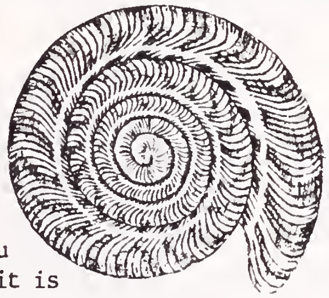
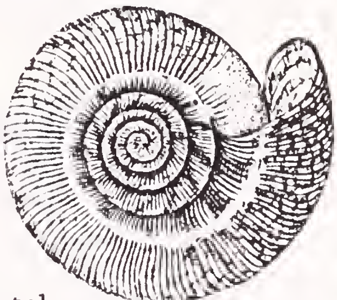
This had a restricted distribution and I think is at the northern extreme of its range. It is loosely coiled with broad straight brown radial markings on a light background, a different look entirely from the other two **Cavellias.** It is very common further south.





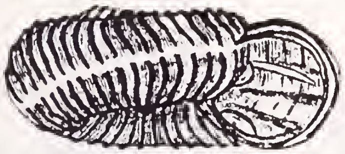
Cavellia buccinella (Reeve).
2.4 x 1.2 mm.

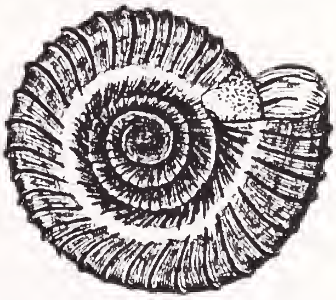
Mangatawhiri. Common and fairly hardy it has a distinctive "speckled" look. Which doesn't mean I am not always mistaking it for something else at times, but there is nothing to confuse it with around Auckland. Suter mentions albino specimens occurring with quite a lot of species but **buccinella** is I think the only one I have ever seen albinos from.

Cavellia reeftonensis (Suter).
3.7 x 1.8 mm. Waharau

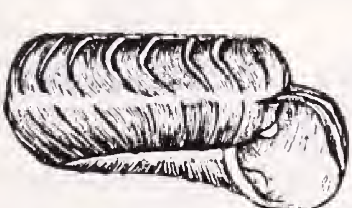
Superficially similar to **buccinella** but it is tighter coiled , generally larger, more whorls,and has closer very acutely angled ribs. In fact a snail with a very fine shell, but not very common around Auckland. There appears to be uncertainty whether this northern snail is indeed **reeftonensis** or perhaps is a separate species. It has been named **roseveari** (Suter), from time to time making it seem as if there were two species here.



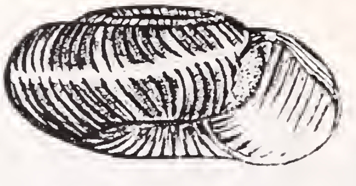


Fectola infecta (Reeve). 2.8 x 1.2 mm.
Te Morehu Res.

Not all that common in South Auckland though certainly more plentiful than **mira.** In other places I have found this to be a common snail so I was probably expecting a similar result here .It seems to be evenly distributed over the range of sites from Dingle Dell to Ngaheretuku to the Hunua Catchment without showing any preferences and may be more numerous than the figures allow.



Fectola mira (Webster) 2.2 x 1.1 mm.
Wairoa Dam. This species is always difficult to sort from **infecta.** The aperture is always full of dirt or animal so the obvious difference, the lack of a palatal lamella, difficult to ascertain. Indeed in the past there has been doubt that it has been a separate species but **mira** alone has a peculiar bifid parietal lamella which I think puts it beyond doubt.



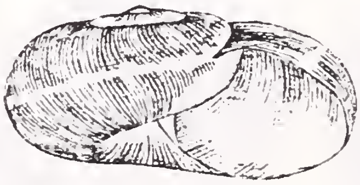

Fectola unidentata Climo 3 x 1.4 mm.
Te Morehu Reserve

One parietal lamella and stout but not plate-like ribs separate **unidentata** quite readily from the other two. It was reasonably common, more so in the smaller Reserves than in the main Hunua Catchment area.


Flammocharopa costulata (Hutton).
3.3 x 1.7 mm

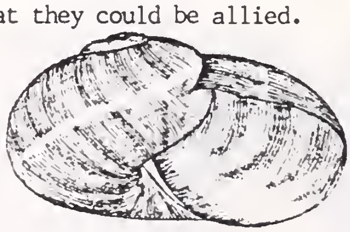
Waharau, Pukatea. A fairly large reddish shell, reasonably hardy for a shell with such a large aperture. It has very fine ribs and in the juvenile stage can look quite exotic and different, looking like one of the following species which are rare and always a thrill to find.


Fammocharopa sp. a 2 x 1.3 mm.
Mangatawhiri. I don't think these are necessarily related to **costulata** at all but there seems to be a group of similar type snails living in the north but all very scarce. This one has a very narrow umbilicus and strongly spiralled protoconch. Ribs are a bit coarser than **costulata** and I found two on this survey and four on the previous Waitakere survey.



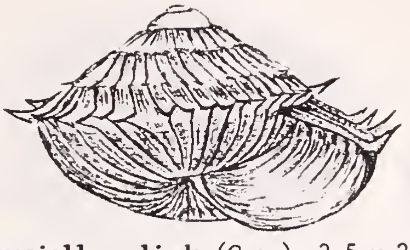
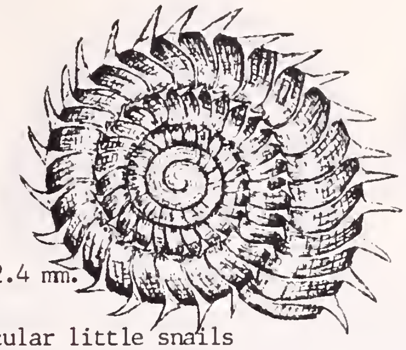
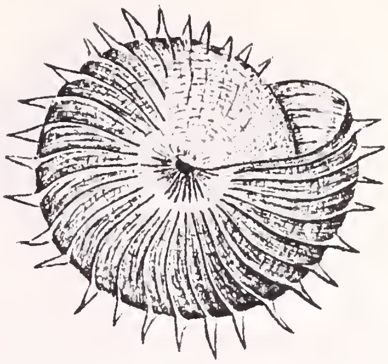

Famrocharopa sp. c. 2.1 x 1.1 mm.
Mangatawhiri.

This is a flatter shell which also has a strongly spiralled protoconch. It was not common but I found it in the Waitakeres and also in the Coromandels where at one spot, the Port Jackson Sc. Res. I collected 8 specimens. This shell is tighter coiled than the others and has a wider umbilicus . I called it **cf pilsbryi** at Coromandel, thinking at that time that they could be allied.



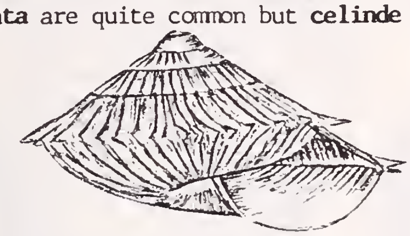
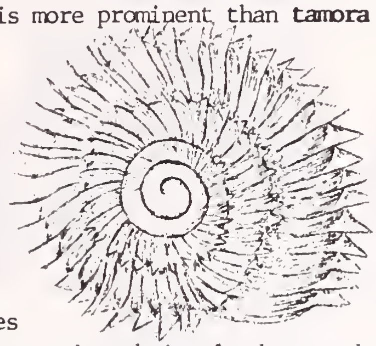
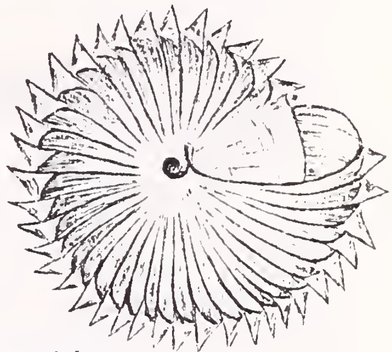

Flammocharopa sp. d. 2 x 1.5 mm
Mangatawhiri.

I did not find this again on this survey , the only one in the first Report which failed to reappear. I found one each on Table Mt. and the Hihi Trig, Coromandel and together with this one they are the only three known I think.

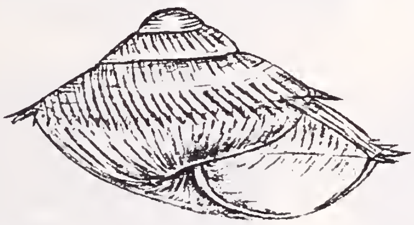




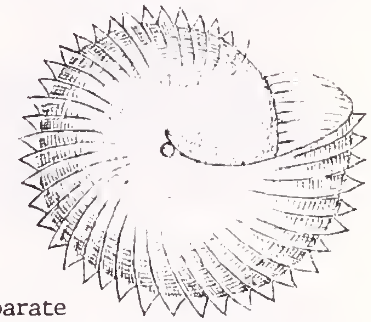
Therasiella celinde (Gray). 3.5 x 2.4 mm.
Mt. William Res.

Perhaps these are our most spectacular little snails though unfortunately the spines have often worn off. Without these processes **celinde** can be quite difficult to separate from **tamora**.The group is well represented around Auckland and all except **serrata** are quite common but **celinde** is more prominent than **tamora** which reverses the Waitakere scene.

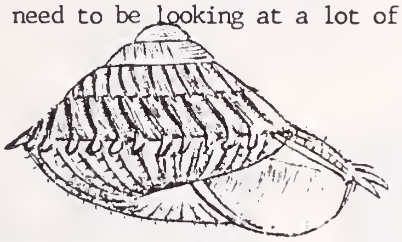
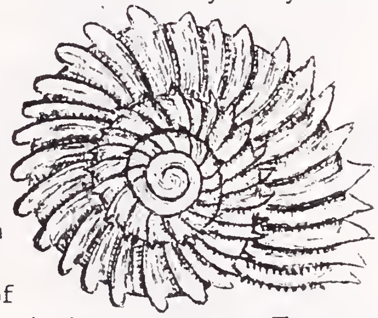
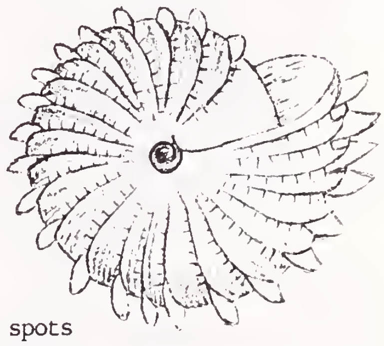
Therasiella neozelanica Cumber.
3.2 x 1.8 mm.
Ponga Rd. Res. I have changed the names here from the Waitakere Report as Cumber quite obviously drew a shell with large overlapping processes when he described **neozelanica**, not one with small distinct purely peripheral and separate ones. It was Bruce Hazelwood that drew this to my attention.



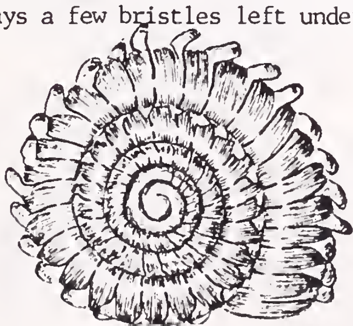
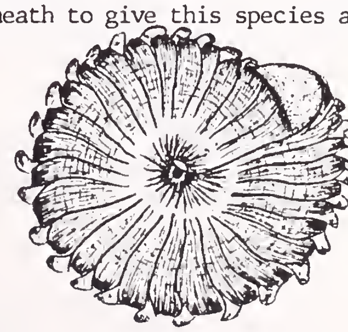


Therasiella cf neozelanica 2.3 x 1.4 mm.
Olive Davis Reserve.

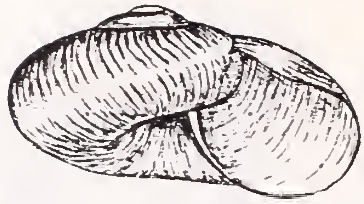
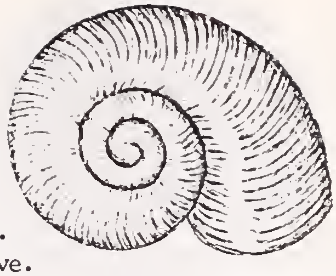
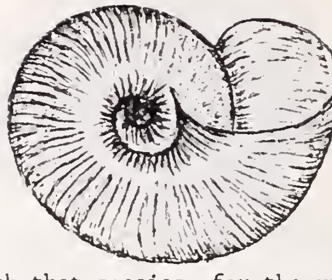
Like **tamora** and **celinde** these two **neozelanicas** can be very hard to separate without the processes. However, it is not impossible as the shells are structurally different but you need to be looking at a lot of shells and have your eye in!

Therasiella serrata Cumber 2.5 x 1.5 mm
Point View Rd.
Howick. I only found this at a couple of spots not far removed from each other so it is not common. These two spots were on the eastern edge of our area, and it was common at Coromandel but absent from the Waitakeres. Even if the shell is worn there is always a few bristles left underneath to give this species away.

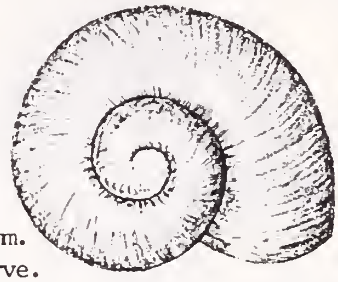
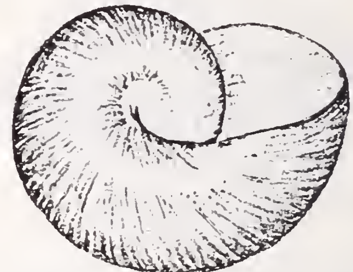




Therasiella tamora (Hutton). 4 x 2.5 mm.
Te Morehu Res.
A rich red-brown colour is perhaps the easiest distinguishing feature for **tamora** as **celinde** has a much lighter, almost staw brown shell. The processes of course tell the whole story but they are so often missing.

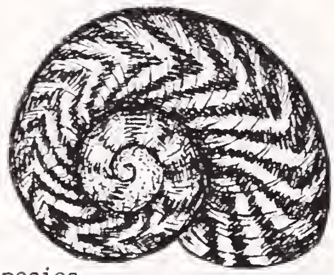
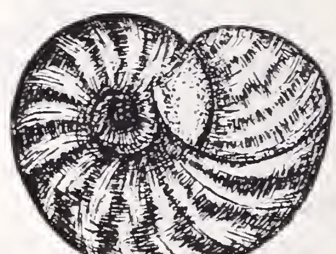
Flammulina chiron (Gray). 5 x 2.8 mm.
Mt. William Reserve.

Not as hardy or plentiful as **perdita**, it can easily be confused with that species, for the ribs which distinguish **chiron** are thin and easily rubbed off. **F. chiron** is not uncommon, is reasonably hardy and was found in large numbers in the Wiri swamp.Except for **perdita** moisture seems to be very important for Flammulinids and the bigger snails like **zebra** will only be found in very damp spots.

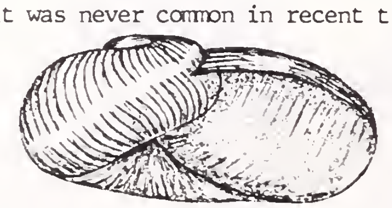
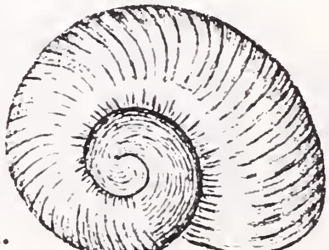
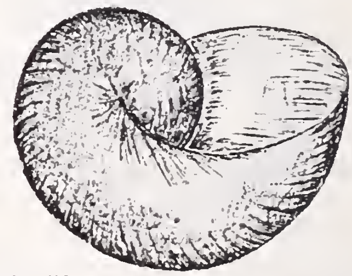
  

Flammulina cornea (Hutton). 4 x 2.5 mm.
Clevedon Scenic Reserve.

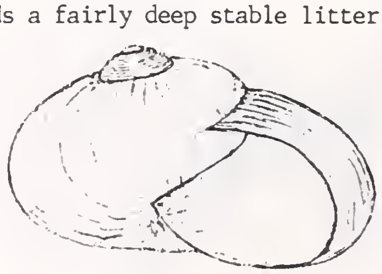
This is a North Auckland snail,not common, and here at the southern end of its range (Pauline Mayhill reports one from Whangamata).The shell is quite fragile and without an umbilicus but the animal seems to be unknown. I have never seen a live specimen but get the impression from the shell that it might be quite a large animal.

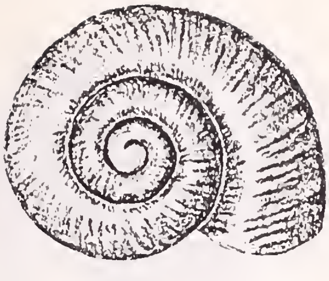
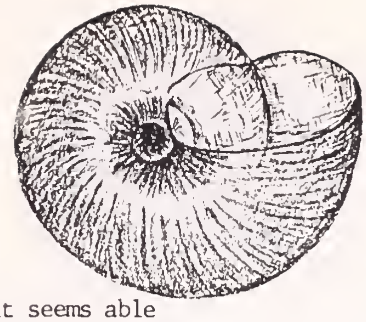
Flammulina crebriflammis (Pfeiffer)
5.5 x 3.5, Wairoa Dam. Although this species is found throughout New Zealand it is quite rare in South Auckland and I only found it at one spot. It can be confused with **zebra** as both shells have a strong colour pattern but whereas **crebriflammis** has a wide umbilicus **zebra's** is nearly closed. Suter doesn't mention either species from Auckland so it was never common in recent times.

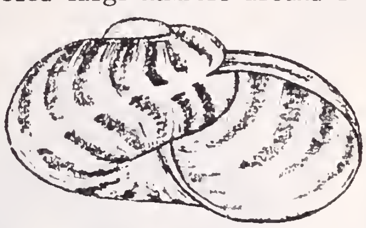
Flammulina feredayi (Suter). 2 x 1.3 mm.
Mangatawhiri. A snail with a delicate white, quite beautiful shell. It is reasonably common in the area and could really only be confused with the following species which however is quite rare. It was noticeable that it was only found in good stands of bush and didn't stand much modification. Perhaps it needs a fairly deep stable litter.

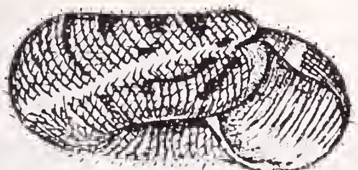
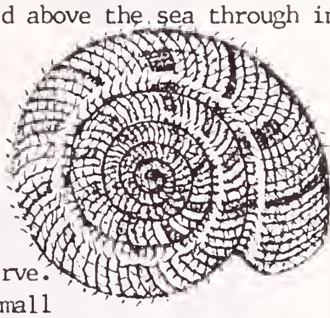
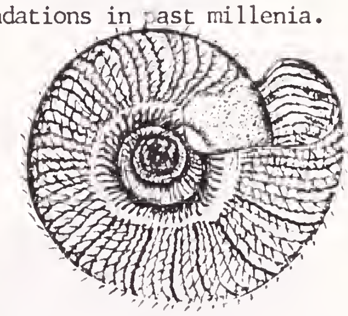
Flammulina cf feredayi 2.4 x 1.7 mm.
Kohukohunui. Although I have found this snail in other parts of the North Island, I only found it at one rather specialized spot here. It is much more globular than **feredayi,** and somewhat larger.

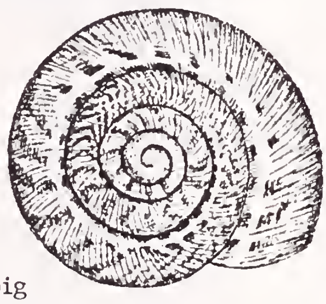
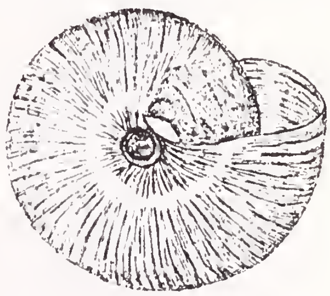
Flammulina perdita (Hutton).
5.5 x 3.3 mm.
Moumoukai Hill Rd. A hardy snail found throughout New Zealand. It seems able to colonise a large range of habitats without making that final jump to garden or pasture. I have collected large numbers around the base of Rimu trees showing that it lives on the trunks, under the bark probably.



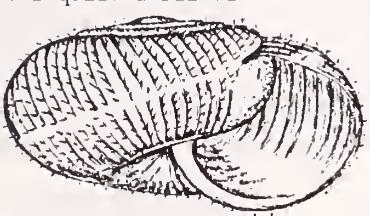
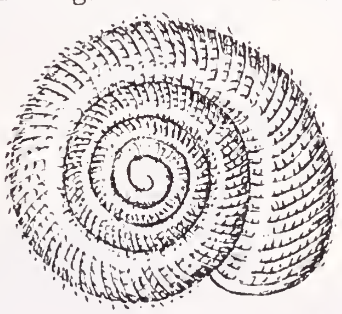
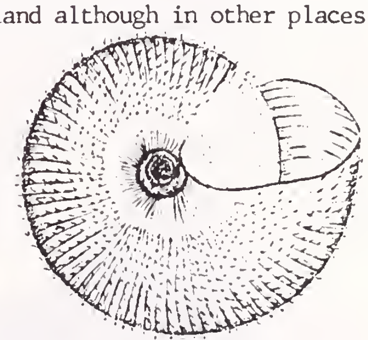
Flammulina zebra (Le Guillou). 3.8 x 2.3 mm.
Kohukohunui. I only found this at the one spot. Kohukohunui is the highest point in the Hunuas and is fairly damp and misty for most of the year. I think it also represents a high spot which has remained above the sea through inundations in past millenia.

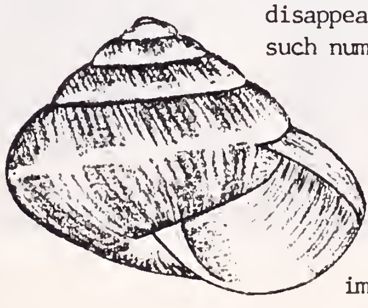
Suteria ide (Gray).
7.5 x 4.5 mm. Te Morehu Reserve.
A snail which can grow quite large (in small snail terms!). It is a mobile, successful animal with a spectacular shell covered with wavy ribs deep colour bands and hairs. It covers the North Is. and much of the South and in places is prolific.

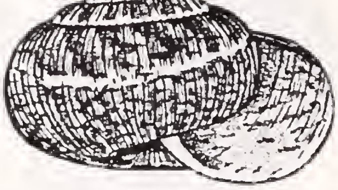
Therasia decidua (Pfeiffer). 8 x 5 mm.
Te Morehu Res. A fairly big shell found more in fringe locations and around the coast than in deep bush. It has a sister species **Thalassohelix zelandiae** from which it is indistinguishable around Auckland although in other places they appear quite distinct.

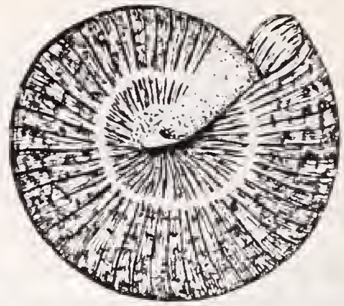




Thalassohelix ziczag (Gould). 7.5 x 4 mm.
Almorah Rd. Mt. Eden.
A large snail which can dominate a coastal situation but gradually peters out but never entirely disappears from the deepest bush situations. I was surprised to see it in such numbers at Almorah Rd. and competeing with **Suteria**.

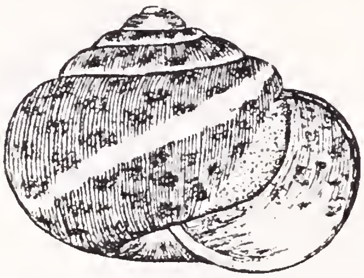


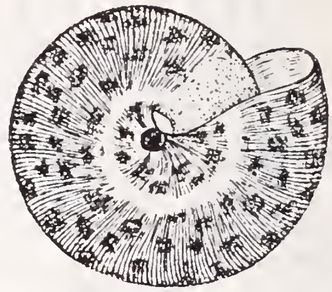
Serpho kivi (Gray). 7.5 x 5.5 mm. Forest and Bird Soc. Res.
Onetangi, Waiheke. The biggest and most obvious herbivore in the area. I think it is very common and lives on quite a range of young trees indeed at one spot I found it chewing on the dreaded Ginger plant. It is undoubtedly a **Therasia** and one can only hope that an imaginative taxonomist will find a way to preserve the present name.



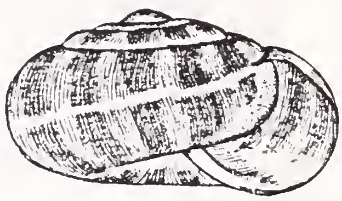
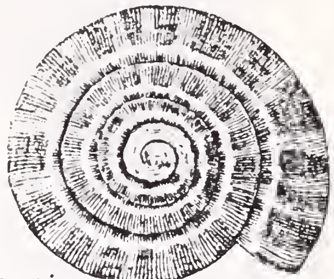
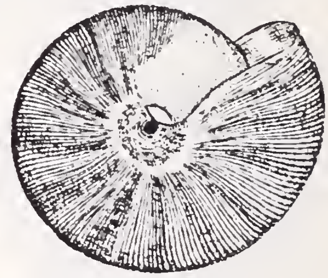


Allodiscus dimorphus (Pfeiffer).
9.5 x 6.5 mm. Hunua Gorge.
I think this is a larger "roaming" snail not much found in leaf litter samples. I have seen a number of them in live Nikau fronds and Powell mentions them in Astelia growing on trees. Apart perhaps from **urquharti** none of this genus is particularly numerous in South Auckland.

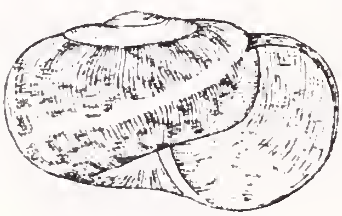
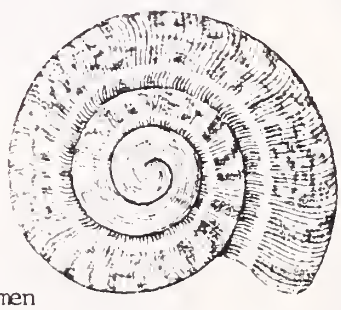
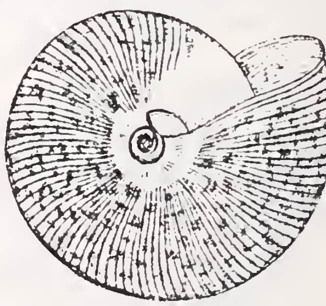




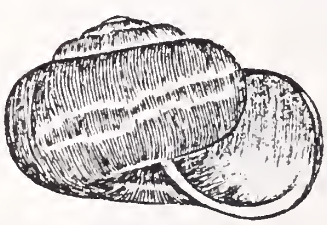
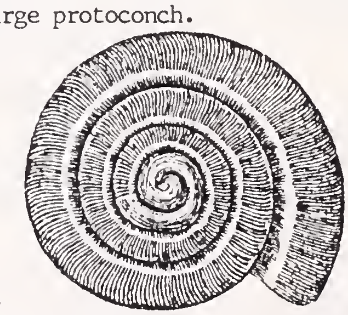
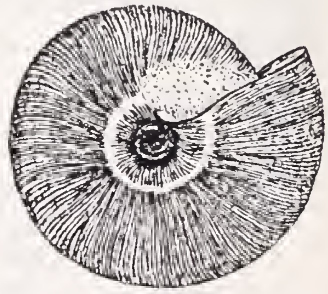
Allodiscus miranda (Hutton). 3.3 x 2.4 mm. Te Morehu Reserve.This shell is very close to **granum** but has coarser ribbing. The ribs of **miranda** are obviously quite fine but alongside **granum** they are positively coarse.It seems to be generally believed that **granum** does not extend this far north .

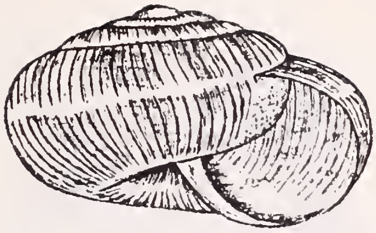
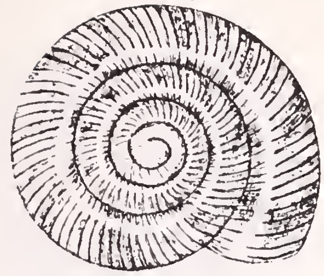
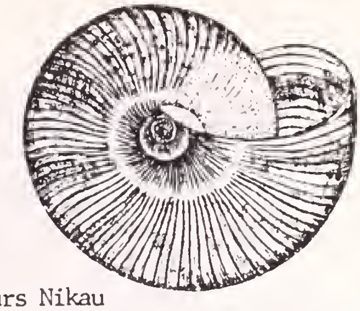
Allodiscus planulatus (Hutton).
3.5 x 2 mm. Mangatangi.
This is a widespread species but quite rare in South Auckland. Indeed it was rare in both the Waitakeres and the Coromandels. I always identify it by the strong spirals around the very narrow umbilicus, the very fine ribs and tightly coiled whorls.

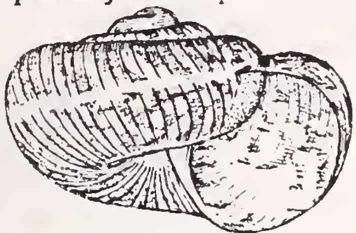
Allodiscus tessellatus Powell.
A juvenile specimen from Kohukohunui.2.4 x 1.2 mm. For me this has been an elusive snail both here and at Waitakere. I only seem to get bits or juveniles and have really only seen two decent shells at Titirangi. The one I have drawn here seemed to have a very large protoconch.

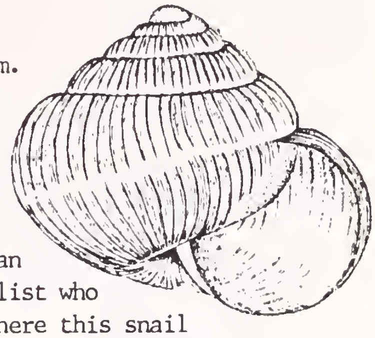
Allodiscus urquharti Suter. 1.8 x1.3 mm.
Hunua Gorge.Not easily mistaken, this shell is fine ribbed with a plain rather distinctive brown colour..It is quite common in the litter and occasionally grows to a large size which makes you think it is a new species.

Phenacohelix giveni Cumber. 5 x 3 mm.
Clevedon Scenic Reserve.This species greatly favours Nikau and its look-alike **ponsobyi** likes rocky ground.**P. giveni** has a smooth or slightly pitted flat protoconch whereas **ponsonbyi** has a peculiar lifted protoconch shown in the juvenile below with strong spirals.



Phenacohelix ponsonbyi (Suter) 4 x 2 mm. Mt. Wellington. This is not common around Auckland but **giveni** is plentiful.



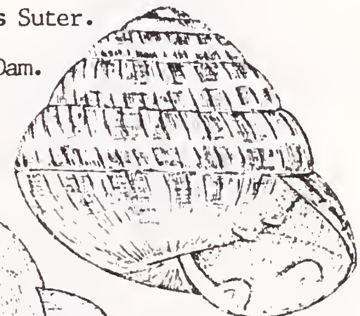
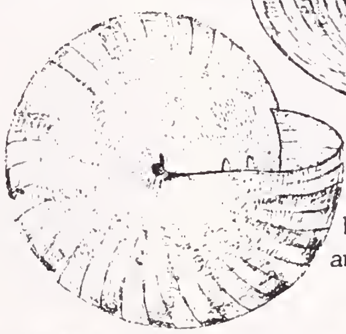
Phenacohelix cf pilula.3 x 2.7 mm. Paerata Scenic Res. This beautiful golden coloured snail is prominent on the Manukau Peninsular but doesn't properly get into our area. I always think of it as **douglasi** and remember Norman Douglas of Waiuku, a fine naturalist who rescued the Waipipi Scenic Res.where this snail is at its best.



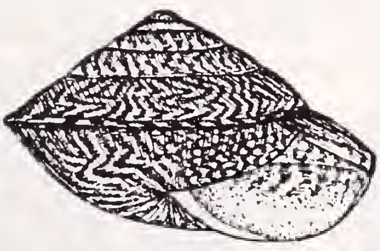
Phenacohelix pilula (Reeve).3.2 x 2.3 mm. Wairoa Gorge. Found throughout New Zealand but not very prominent in South Auckland. It looks a lot like **ponsonbyi** but is always taller and does show up in this survey as a fairly hardy snail.


Hunua Gorge
2 x 3 mm.

Laoma leimonias (Gray). A shiny little shell which is plentiful and very hardy at least in this area.It covers the whole spectrum of locations and tends to proliferate in marginal and somewhat modified bush, where it can achieve very high populations.

Laoma pirongiaensis Suter.
2 x 1.7 mm Wairoa Dam. A dark appearing snail yet with a silky glistening exterior. It is plentiful in the main ranges but falls right away with any marked modification.

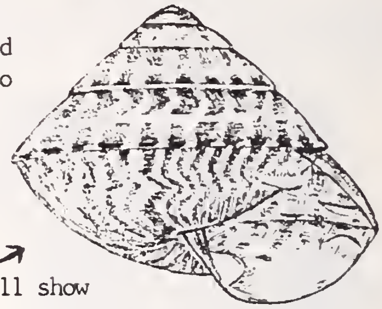


Laoma mariae (Gray). 7 x 4 mm. Te Morehu Res.
This snail can always be identified by the narrow lamella high up on the parietal wall of the aperture. Together with **F. chiron** it was a prominent snail in the Wiri Swamp, but otherwise it tended to disappear in marginal conditions and seemed to need a fair bit of moisture.

Juveniles from Wairoa Dam
2.4 mm

Laoma marina (Hutton). 3.2 x 2.7 mm.
Moumoukai Hill Rd.

In contrast with the Waitakeres, this species was not plentiful and **cf marina** was abundant. With so few specimens, it wasn't possible to trace many variations in lamella configuration, but there were some. I think the columellar lamella and the prominent one half way up the parietal wall are constant and all the rest can be variable though never as heavy or crowded as in **cf marina**.

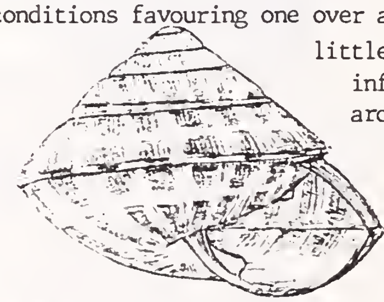


Laoma marina (Hutton). 3 x 2.4 Rooseville Park Pukekohe. Just a ↗ little different, but individuals in the same colony will show quite large variations.

Laoma cf marina 3.8 x 2.6 mm Hunua Gorge.

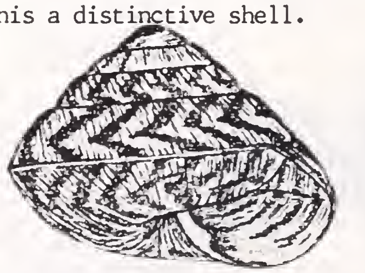
This is the strongly carinated shell so prominent in the Hunuas. It also has variable lamella but with possibly the one exception below I am sure they are all one species. The prominence of one species over another sister species has more to do with historic events I feel than conditions favouring one over another. With the right key these little snails could unlock a lot of information about land movements around the Auckland Isthmus in the distant past.

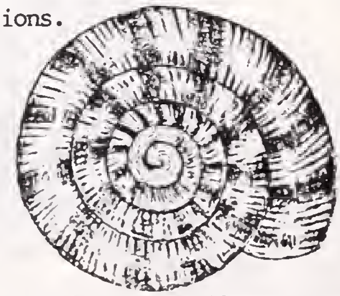
Laoma poecilosticta (Pfeiffer). 3 x 2.8 mm.
Mt. William Reserve. This is a prominent snail and quite plentiful in the area though it has a somewhat limited range in the upper North Island. The coarse strong ribs and single lamella make this a distinctive shell.

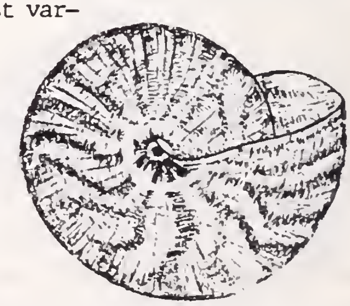


Laoma cf marina (a). 2.9 x 2.2 mm.
Totara Park. There was a colony of these snails that had very few lamella. Perhaps it was just an oddity for I found them nowhere else. Dr. Climo proposes recognising just the two mainland species with a couple of extras that are mainly confined to the offshore islands. All the rest just variations.

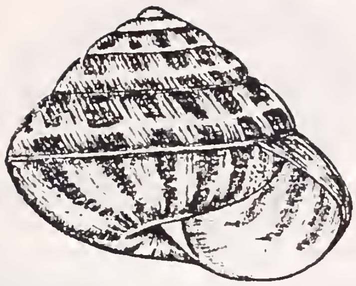
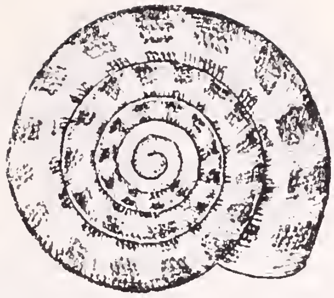
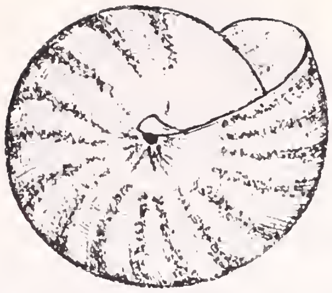
Laoma cf marina 3.5 mm.
Clevedon Scenic Res.



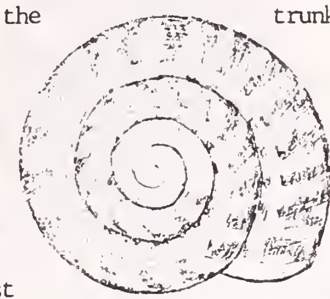
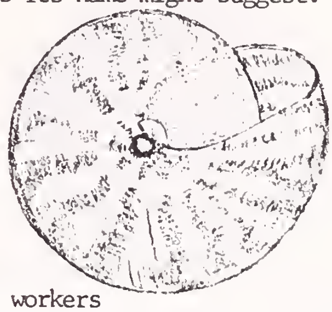




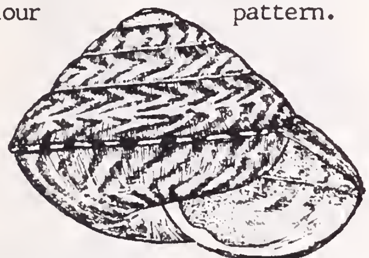
Laoma transitans (Suter). 2.3 x 1.8
Mt. William Res. This has the collumellar lamella of **poecilosticta** but not as prominent, neither is the ribbing very pronounced and the last whorl is not so sharply angled and not carinated. In fact a sort of muted **poecilosticta** and somewhat drab.

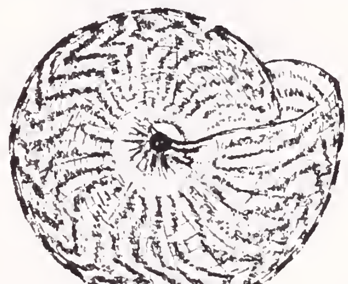




Phrixgnathus ariel (Hutton). 2.8 x 2.2 mm. Olive Davis Reserve. Strongish corrugated type ribs on a lightly angled shell make this species fairly easy to identify. I usually tip it over to find those cartwheel type broad straight brown spokes on the base to make doubly sure. It likes to get above the ground into the trunks as its name might suggest.

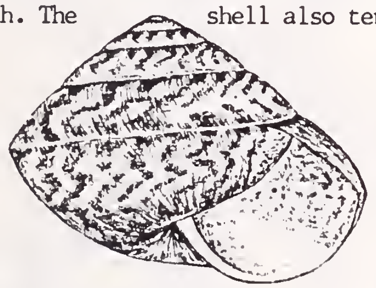




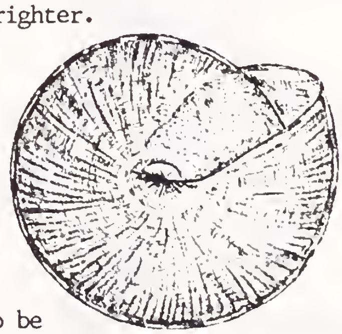
Phrixgnathus cf ariel 2.8 x 1.7 mm. Orakei. I have just linked these species for convenience, for it never had a number and workers have been using Dr. Climo's manuscript name. It is very coastal and can be found in large numbers at some locations. At Kirkbrides Bush it is living in the flax. It is smooth and shiny with a nice colour pattern.



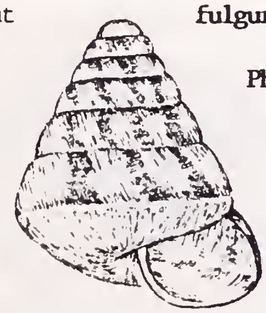


Phrixgnathus conella (Pfeiffer). 3.2 x 2.2 mm Wairoa Dam. This one and the next are difficult to separate, I suppose because their features overlap. At either end of the spectrum they can be quickly dealt with but in the middle they are hard, and only experience can make it easier.At its best **conella** has the fine silky ribbing particularly on the teleoconch. The shell also tends to be taller and the colours brighter.





Phrixgnathus fulguratus Suter. 3 x 2.2 mm. Ngaheretuku.This tends to be a duller shell without apparent ribbing, at least a **conella** type of rib is there in embryo but never becomes pronounced. Underneath, spiral sculpture is much more evident in **fulguratus** whereas in **conella** it is fine radials that capture your attention.Both species are plentiful but **fulguratus** is more likely to be found at certain sites in large numbers.

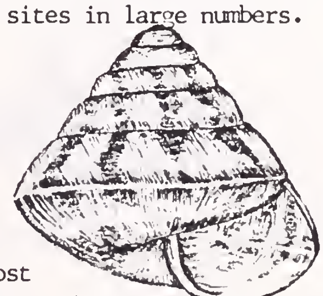


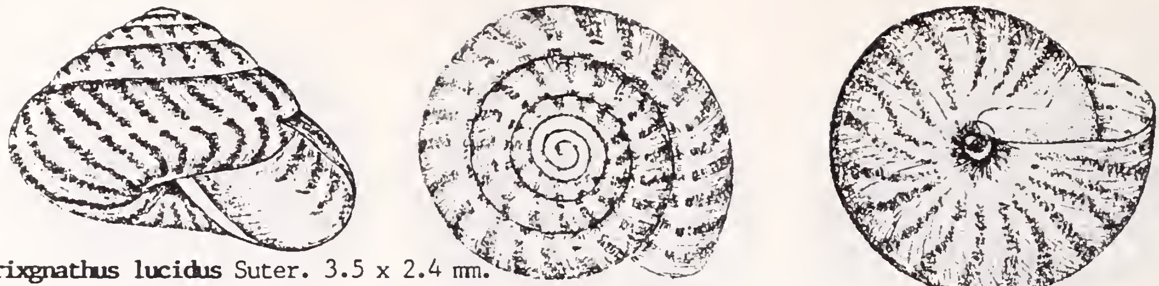
Phrixgnathus erigone (Gray). 2 x 1.9 mm

1.7 x 1.2 mm

Te Morehu Reserve.

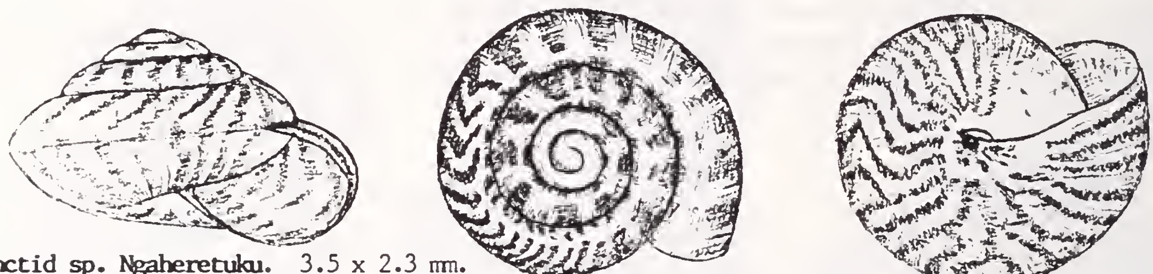
With a rather limited range in the northern half of the North Island, I think **erigone** reaches its zenith in the Hunuas. It turned out to be one of the most widespread and numerous species. These two specimens from Te Morehu were the most divergent I encountered in an otherwise remarkably uniform species.



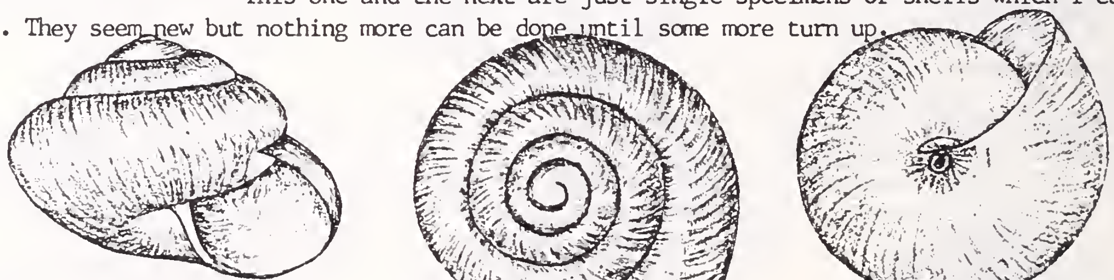


Phrixgnathus lucidus Suter. 3.5 x 2.4 mm.
Ngaheretuku. Reasonably common in places,more often than not the colour pattern is faded and it presents an ivory coloured appearance. It used to be lumped with **cf ariel** but they each live in quite different habitats.

Phrixgnathus cf lucidus 2.5 x 1.7 mm. Mt. William Res. Bold markings on a pearly background and a partly closed umbilicus make this snail easy to recognise. So far it seems to be restricted to South Auckland and the Coromandels.



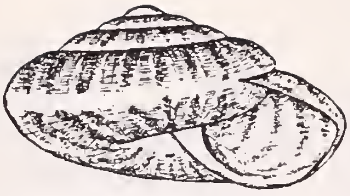
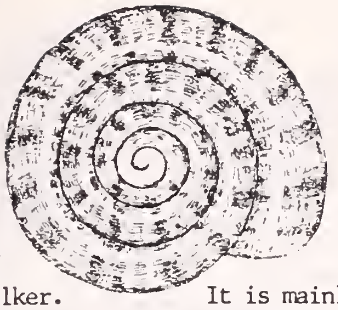
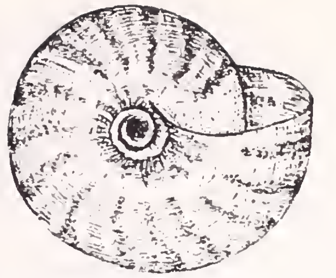
Punctid sp. Ngaheretuku. 3.5 x 2.3 mm.
This one and the next are just single specimens of shells which I cannot place. They seem new but nothing more can be done until some more turn up.



Punctid sp. Wairoa 1.4 x 1.1 mm.

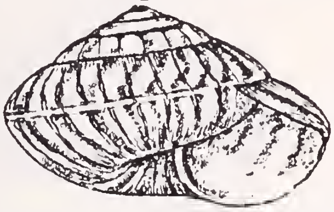
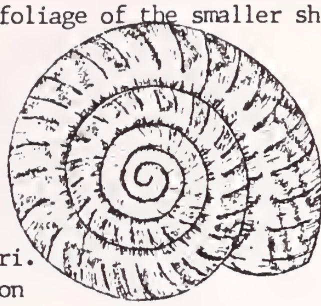
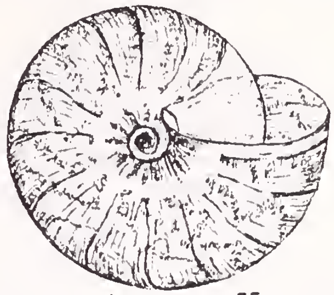
Phrixgnathus glabriusculus (Pfeiffer).
2.6 x 1.3 mm Waharau. This snail and the next were previously lumped together. This is smooth and shiny but surprisingly scarce in my collecting. I am fairly sure it is a herbivore, at least it is often found in low shrubs which may explain its scarcity in this collection.

Phrixgnatus cf glabriusculus
2.4 x 1.3 mm.
Wairoa Dam. On the other hand this shell is dull and darker coloured with radial growth lines and fine spiral sculpture very evident especially on the base.It seemed to be more plentiful so perhaps it lives on the ground.

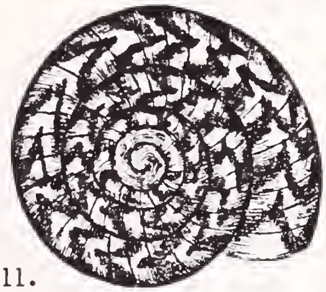
Phrixgnathus moellendorffi Suter.
3 x 1.8 mm.

Ponui Is. I did not collect this myself but received it in a lot from Martin Walker. It is mainly a coastal species and there are not a lot of suitable sites in South Auckland. I am reminded that I didn't see it during the Waitakere survey either but later on a Shell Club trip to Titirangi on a very wet day, **moellendorffi** seemed to be everywhere crawling about on the wet foliage of the smaller shrubs.

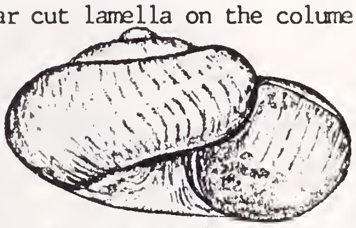
Punctid n.sp. 55 2.8 x 1.7 mm Mangatawhiri.

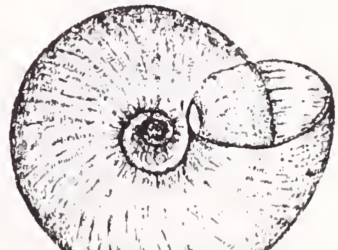
This species is very common and may be at its best in South Auckland. At a certain stage of bush regeneration **n.sp. 55** can take over the litter and become prolific but in older bush it resumes only a moderate prescence.A Reserve in Howick with a lot of young Matipo seemed to be at the right stage and contained thousands of **n.sp.** 55.


Punctid cf n.sp. 55. 2.5 x 1.9 mm. Parnell.

I only found this at one very marginal sight in Parnell.I think this must be at its southern limit but though I never recorded it at all in the Waitakeres, I find that in fact I had overlooked it amongst the **cf poecilostictas** or **transitans** as I have named it here. **fPunctid cf 55** has similar ribs to **55** though a little closer , a sharply angled, slightly carinated body whorl and a clear cut lamella on the columella.





Pasmaditta jungermanniae (Petterd).
1.9 x 0.9 mm.

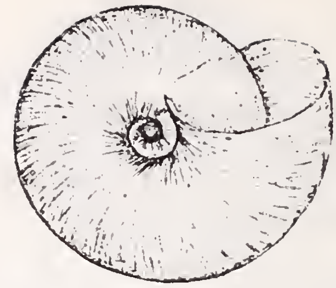
Te Morehu Reserve. A plain rather nondescript shell which I always find hard to identify. Although it seems widespread in New Zealand I have never found it to be prolific, yet it gives the appearance of hardiness. I suppose **viridulus** would be the shell this one might be confused with as the colour and sculpture are similar but the umbilicus is a giveaway.



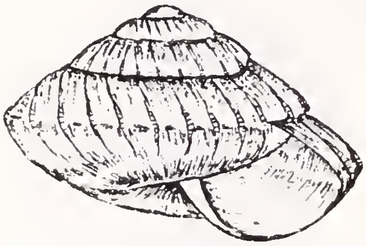
Pasmaditta cf jungermanniae 1.6 x 1.1 mm.
Clevedon Scenic Reserve.

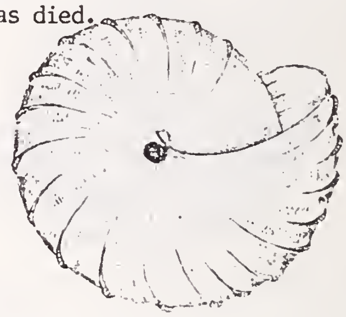
I only found this at the one spot though it was fairly common there. It was obviuosly derived from **jungermanniae**, though taller and with a smaller umbilicus.



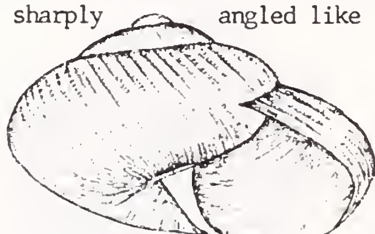
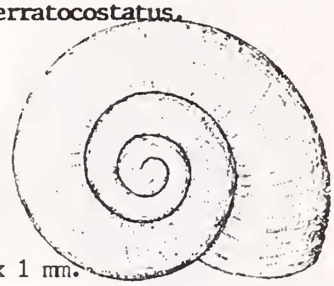
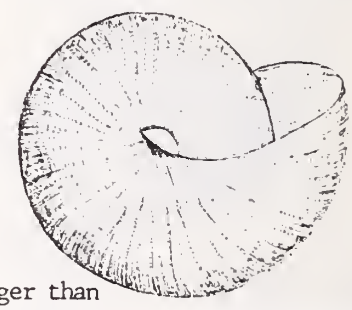


Pasmaditta miserabilis (Iredale)
1.5 x 0.8 mm.
Ngaheretuku. All of these tiny Punctids with one or two exceptions are hard to find,and they don't show up in the lists with any great numers. Yet some of them, like this one are quite widespread so the reason for their scarcity probably lies in the very fast breakdown of their shells once the animal has died.

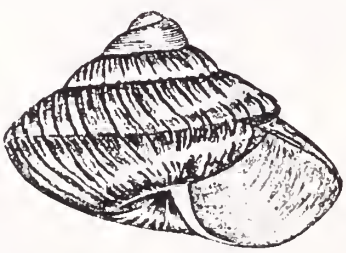
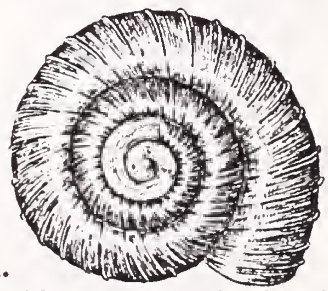




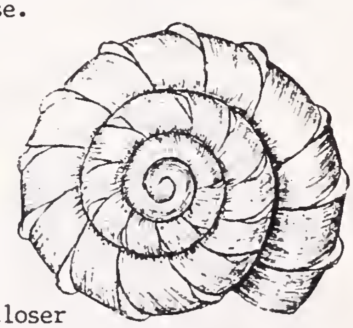
Phrixgnathus serratocostatus Webster
1.1 x 0.7 mm. Clevedon Scenic Reserve. This tiny snail with the distinctive ribs has reached nearly every corner of New Zealand. Without its ribs it can be hard to place though not many specimens are quite devoid of them. In this area also hardly any of the tiny shells are sharply angled like **serratocostatus.**

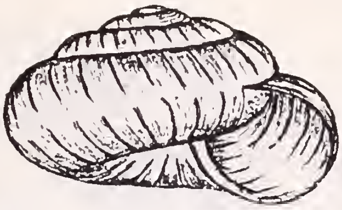
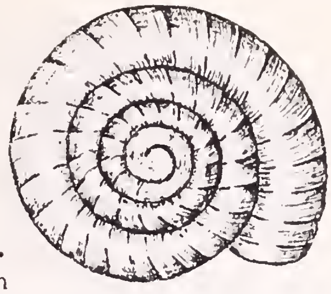
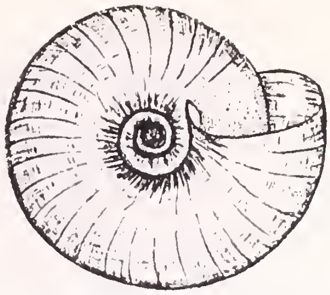
Phrixgnathus viridulus Suter 1.5 x 1 mm.
Mangatawhiri. This will grow quite a bit larger than the one illustrated but the shells are particularly thin and the large ones are always damaged. It has few rapidly expanding whorls and as the name implies the shell is supposed to have a greenish tinge.


Obanella rimutaka Dell. 1.8 x 1.1 mm.
Ngaheretuku. Reasonably common and hardy, this shell has stout ribs which are not really developed into the plates common to the other members of the genus. It is spread over most of the North Island and a little of the South and in this area at least cannot be confused with anything else.

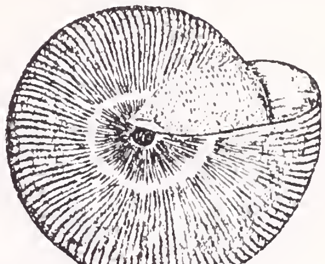




Obanella cf rimutaka 1.4 x 1.1 mm.
Kohukohunui. A closer cousin to **spectabilis** perhaps than **rimutaka** this snail is very distinctive when the shell is undamaged. The well spaced large thin platelike ribs fold over at the top, the protoconch is a funny bulbous affair and the last whorl of the shell drops away quite dramatically.

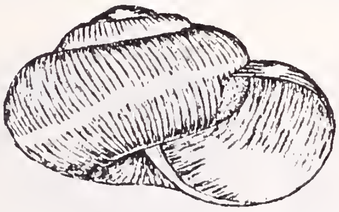
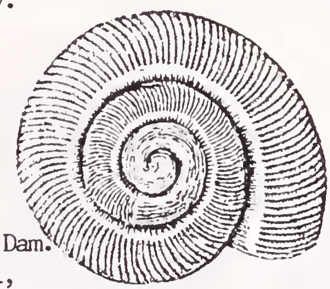
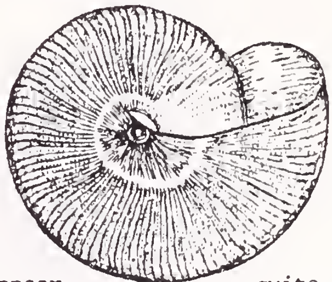




Paralaoma lateumbilicata (Suter)
1.5 x 0.8 mm.
Waiti Beach.A common hardy snail which nevertheless still requires native bush. One of the fragments of bush, much modified, near the Nathan Homestead, Manurewa, had only **lateumbilicata** in the litter and it may have been the earliest coloniser in this bush which had previously lost its native snails.

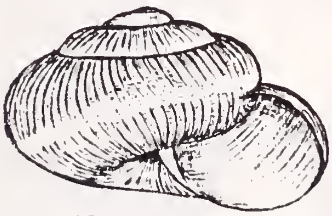
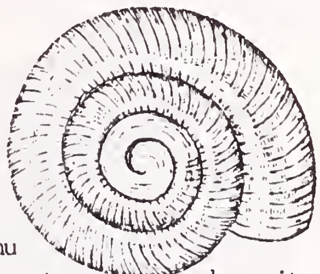
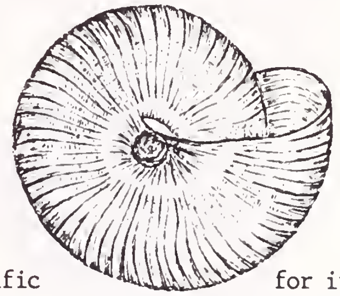




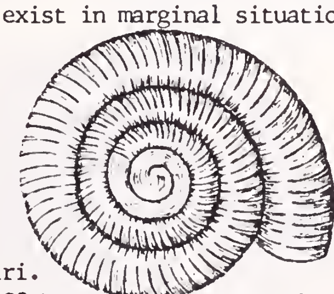
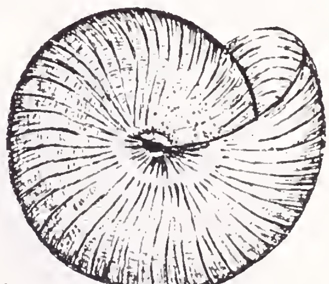
Punctid n.sp. 1 1 x 0.7 mm Mangatawhiri.
This is a tightly coiled closely ribbed, dark brown little shell requiring good bush and deep litter. This is about as small as our snails get and though Dr. Climo has them very well delineated now, they are never easy to identify at this size. Luckily although there is a range of shells looking very much like this one they are in other parts of the country.

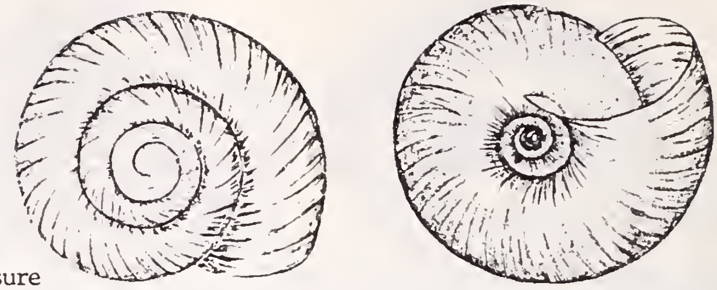
Punctid n.sp. 5 1.3 x o.7 mm. Wairoa Dam.
Slightly larger than **1**, flatter and looser coiled. Although the differences in these shells appear quite small when drawn, they do in fact seem much greater in the "flesh". It seems enough at the moment to just know these small species are present, it may be a long time, if ever, before anyone studies them in depth.

Punctid n.sp. 29 0.9 x 0.5 mm Te Morehu
Res. This small shell must be quite prolific for it is practically the only tiny one turning up in the litter in any quantity. It is mostly colourless but sometimes has a violet or pinkish tinge about it. Rib spacing is variable as is the width of umbilicus and in the past I have spent a lot of time trying to divide it into several species. It is widespread in New Zealand and can exist in marginal situations.

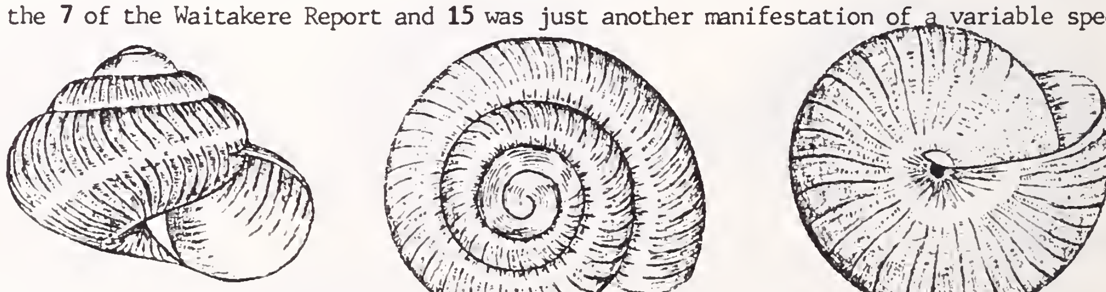
Punctid n.sp. 6 1.2 x 0.7 mm. Mangatawhiri.
This is very similar to **29** but is tighter coiled and has a partly covered umbilicus. It is not common and needs good bush with deep litter.When it occurs with **29** it can easily be overlooked.



Paralaoma caputspinulae (Reeve).
2.2 x 1.4 mm. Mangere, This one I am sure is a fairly recent arrival, for it doesn't seem at home in a full bush situation. In marginal situations particularly coastal areas it can be prolific. I have found it under suburban hedges and rock walls but it is somewhat patchy.

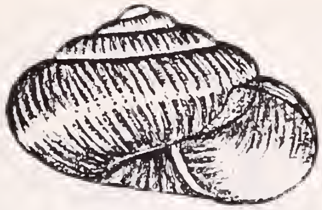
Punctid cf n.sp. 7 1.2 x 1 mm. Ruato Scenic Res. I have found these **7** s very confusing in the past because I never find enough good specimens. I am happier with the two recorded here though **cf 7** was still scarce. This one is not the **7a** of the Waitakere Report and I didn't record it from there.

Punctid n.sp. 7 1.3 x 1.1 mm Cosseys - Wairoa Dam track. I collected quite a number of these and each locality produced a different looking shell - from a solid brown handsome one with extended ribs to a fragile semitransparent one with the ribs mostly rubbed off. This was the **7** of the Waitakere Report and **15** was just another manifestation of a variable species.

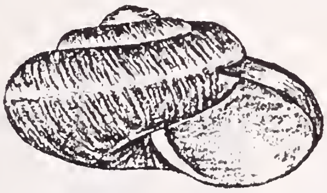


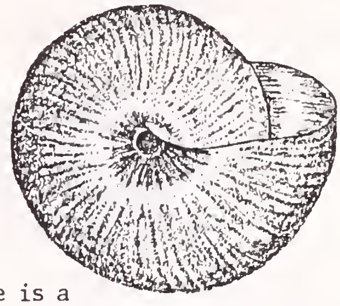
Punctid n.sp. 8. 1.2 x 0.9 mm Hunua Gorge.
A whiteish shell, reasonably common and hardy. Like **7** it is variable in shape and can often look quite spectacular, but mostly it is flat and looking like **29** from above. A consistent identifying feature is its inflated second whorl.

Punctid n.sp. 69 1 x 0.8 mm Mangatawhiri. This is a charming little shell and quite rare at least in this area. I only found one or two in the main Hunua Ranges and I had not previously seen it in either the Waitakeres or the Coromandels, though it could well be there.

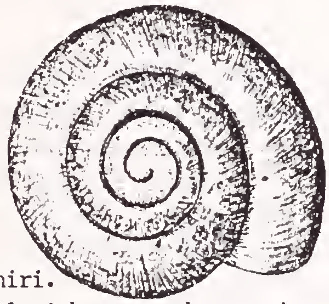
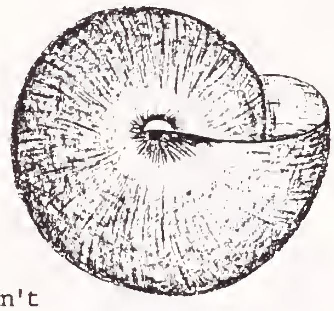


Punctid n.sp. 17 1.8 x 1.3 mm. Waharau. This was a glorious shell in the Waitakeres, golden, strongly corrugated and reticulated with spiral sculpture, a prominent species. In the Hunuas it was scarce and the few shells I found were drab, without much in the way of pronounced sculpture. They didn't seem to grow as large either, at least the ones I collected were generally smaller and flatter.

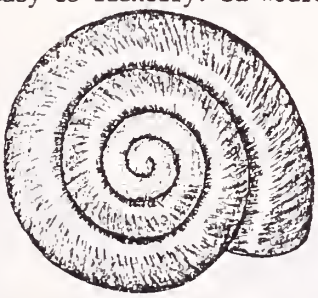
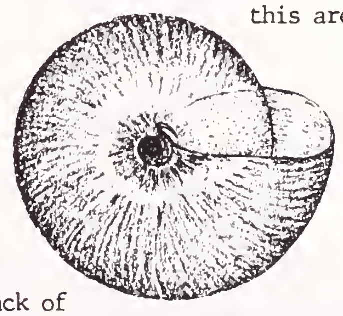




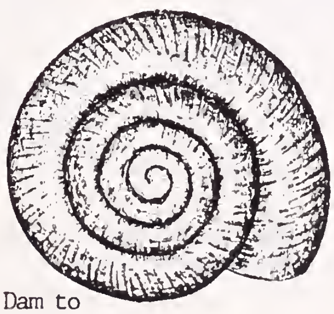
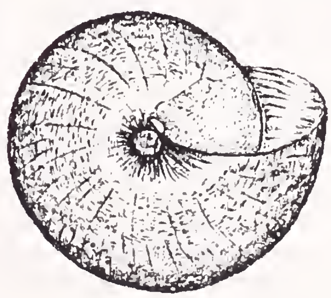
Punctid n.sp. 33. 1.5 x 0.8 mm. Wairoa Dam. I have grouped the illustrations to keep similar "looking" shells together. This one is a sort of smaller flattened **17** with similar though muted sculpture.It was scarce for I only found one shell. Again, this was a species which was common in the Waitakeres.

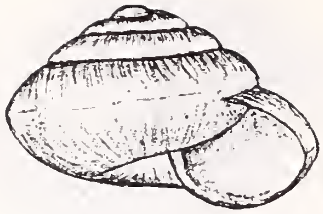
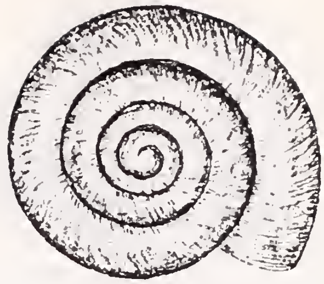
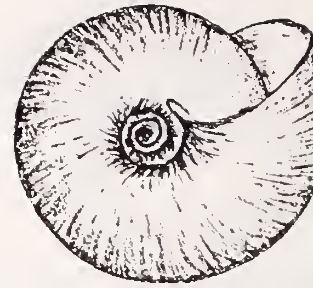
Punctid sp. 30. 1.2 x 0.9 mm Mangatawhiri. A somewhat fragile shell with a smooth exterior. I didn't collect many specimens except in the main ranges though I did collect it at Rooseville Park Pukekohe, a very marginal piece of bush.A nearly closed umbilicus, few rapidly expanding whorls, but mostly just the shape make it fairly easy to identify. **32** would be its closest for appearance in this area.

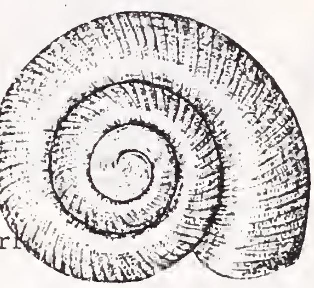
Punctid n.sp. 32 1.3 x 0.8 Wairoa Dam. A plain smooth straw coloured shell, always a bit difficult to identify because of its lack of features. It is reasonably common and fairly hardy and as far as I know occurs throughout New Zealand.

Punctid n.sp. 43 1.6 x 1.4 mm. Cosseys Dam to Wairoa track. Another plain shell, not very common, but occurring over the whole spectrum of sites, indeed slightly favouring marginal ones. I haven't collected this from either Waitakere or Coromandel.

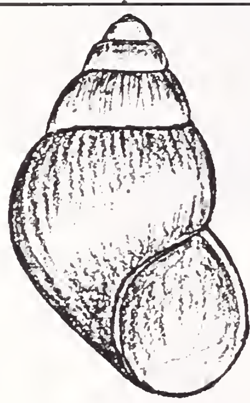




Punctid n.sp. 38. 1.8 x 0.9 mm
Auckland Domain. This is essentially a coastal variety and its presence in the Domain must date back to the time when the harbour reached right up to Carlaw Park and the Domain Bush really was coastal. Apart from one specimen at Dingle Dell I didn't find it anywhere else. I have seen them considerably larger and more angled in fact almost keeled and have wondered if they grow this way in more exposed situations.


Punctid n.sp. 40. 2.6 x 1.4 mm. Mangatawhiri
This is a glorious dark brown strongly ribbed shell not looking like a Punctid at all. I haven't collected many but have seen one from Waitakere and collected it myself from the Ureweras and just recently from Great Barrier Island.

Fresh Water Species Sometimes Found in Bush Litter.



Potomapyrgus antipodarum (Gray). Both specimens found at Ngaherituku

1.6 x 2.5 mm   1.8 x 2.5 mm.

I suppose they must be living in fresh water seepages but often I have found them in just damp litter. Their shape is quite variable and they always fool me when I find them.

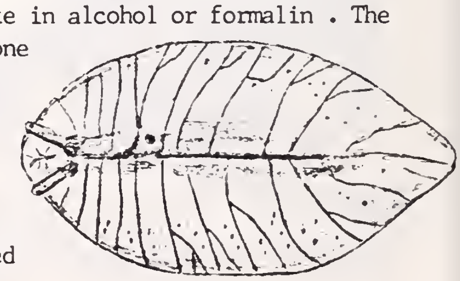
High Tidal Species Sometimes Found in Fringing Coastal Growth.

Suterilla neozelanica (Murdoch)
2 x 2.2 mm
Wiri Swamp under rubbish washed into the reeds by a very high tide. They were there in large numbers.

There is another high tidal species, **Assiminia vulgaris** (Webster) living in similar situations but this is a narrower shell. I have confused the two in the past.

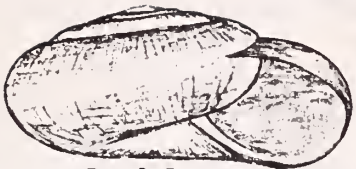
Slugs, which are bona fide land molluscs and I have almost completely ignored in this report.
By just collecting leaf litter samples slugs will almost certainly be missed and though I did inspect a lot of Nikau fronds on the ground I never saw a slug. I have a policy of photographing any specimen I see having long given up taking them home to preserve. The native slugs are such beautiful animals with all their lacy markings but so indiscriminate in alcohol or formalin . The trouble is that my photography is very poor and to date I haven't one picture I am proud of.

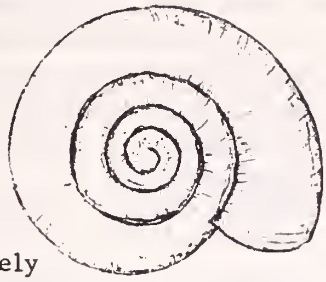
This specimen was from the Wiri Swamp and was found on Flax It was aproximately 3 cm. long and was probably — **Athoracophorus bitentaculatus** (Quoy & Gaimard), though I am not certain of this.

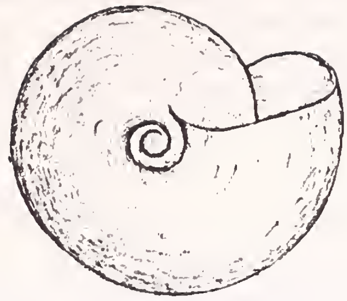


Introduced slugs are very abundant and in some cases have penetrated the native bush more successfully than the introduced snails.

Introduced Species.



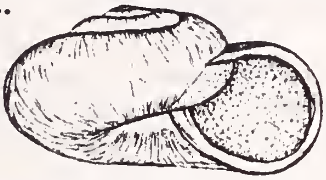


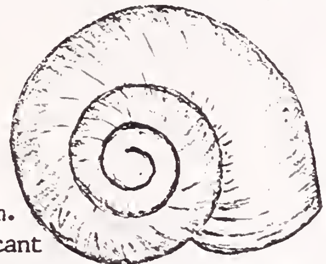


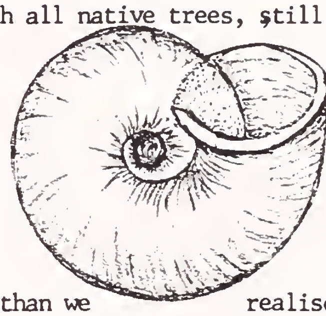
Oxychilus sp..7 x 3.5 mm. Wiri Swamp.

There is a general belief that we have 3 species of **Oxychilus** in Auckland, namely **Oxychilus allarius** (Miller), **Oxychilus cellarius** (Müller), **Oxychilus draparnaldi** (Beck), but no-one seems to have seriously researched this even though they are our commonest species. G.M. Barker has sent me a paper by D.C.Lloyd 'The use of skin characters as an aid to the identification of the British species of **Oxychilus** (Fitzinger)." (J.nat.Hist.,1970, 4: 531-534)., but I haven't tried it out yet. These are the snails most likely to invade the native bush though strangely there seems to be a deterrent in the native litter which resists them for in most unmodified Reserves they have penetrated little if at all.Even some of the Manurewa reserves, greatly modified and with few native snails, but with all native trees, still have no **Oxychilus.**

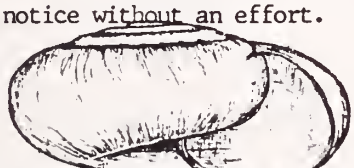
Oxychilus sp. 10.5 x 5 mm. Mangere.

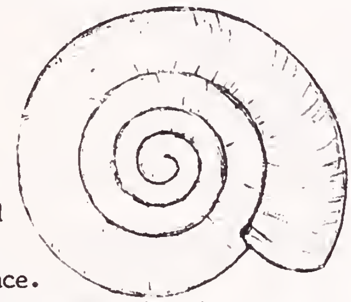


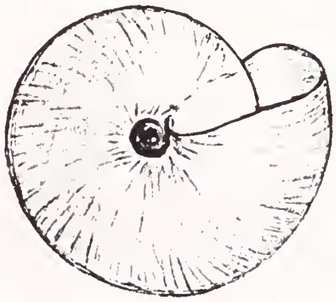




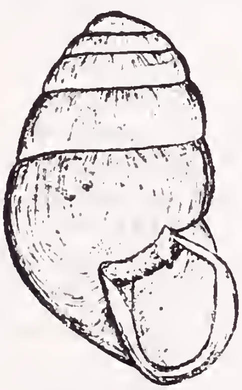
Vallonia excentrica (Sterki). 2.4 x 1.2 mm. Mangere. An insignificant white shell with a thickened expanded lip. I think it is more numerous than we realise. For example on my own section here at Mangere there are literally hundreds in the grass whenever I care to look for them and they seem particularly attracted to a clump of bamboo. They are just too small to notice without an effort.







Vitrea crystallina (Müller). 2.5 x 1.3 mm. Auckland Domain. The name aptly describes this shell which I only found at the one place. This was a bushy site, mostly introduced trees with a lot of Privet but I believe it prefers a wet site. It doesn't appear to be all that common around Auckland.



Cochlicopa lubrica (Müller) 2.4 x 5.5 mm
Mt. Wellington. A prolific snail around Auckland in rocks, under hedges or in practically any cover.

Lauria cylindracea (da Costa). 2 x 3.4 mm
Papatoetoe.This species has taken over the rock walls in much of Auckland and can be present in large numbers.

Vertigo ovata (Say). 1.2 x 1.9 mm.
Auckland Domain. A distinctive little shell with a patchy distribution.

Helix aspersa Müller, 3.2 x 3 mm
Mangere and everywhere in Auckland this is the main molluscan pest.

Cecilioides acicula (Müller) A small slender, narrow, subterranean shell sometimes found in Auckland but which I have never seen. It is tansparent when fresh.

This is the most extensive survey I have done on a specific area, but I have also reported on the Coromandels and the Waitakeres in sufficient depth to list those species not common to all three areas.

WAITAKERES	S. AUCKLAND & HUNUAS	COROMANDELS
C. pallida		
	D. jeffreysiana	**D. jeffreysiana**
R. dunniae	**R. dunniae** (just in the north)	
	D. cf coresia	
	C. septentrionale	**C. septentrionale**
	C. chiltoni	
C. hedleyi	**C. hedleyi**	
Liarea h. carinella	**L. h. carinella** (in the west)	
Ph. cf pseudanguicula a		
Pseud. transenna	**Pseud. transenna**	
		Charopa n.sp.
Par. fuscosa	**Par. fuscosa**	
	Ch. microumbilicata	**Ch. microumbilicata**
E. egesta	**E. egesta**	
	Gem. huttoni	**Gem huttoni**
	Gem. vortex	
	Cav. anguicula	
	Ther. serrata (in the east)	**Ther. serrata**
	Flam. cornea	**Flam. cornea**
	Flam. crebriflammis	
	Flam. zebra	
	Flam. cf feredayi	
Phen. cf pilula	**Phen. cf pilula** (in the west).	
L.cf. pirongiaensis		
	Phrix. cf lucidus	**Phrix. cf lucidus**

Phrix. cheesmani is absent from all these areas and is only present on the Great Barrier Is.

Phrix. francesci		**Phrix. powelli**
		Phrix. regularis
Punctid cf n.sp. 55	**P. cf n.sp. 55** (in the north).	
	Pas. cf jungermanniae	
	Ob. cf rimutaka	**Ob. cf rimutaka**
	Punctid n.sp. 69.	
	Punctid n. sp. 43.	
Punctid n. sp. 40	**Punctid n. sp. 40.**	

This is a somewhat arbitary comparison as some of the rarer snails could easily have escaped detection in the Waitakeres and Coromandels.

I have also arranged the list of species for South Auckland in order of abundance, not according to numbers collected, but numbers of sites where the species was seen. The numbers in brackets are the number of sites.

Mocella eta (99), **Liarea egea** (87), **Phrixgnathus erigone** (81), **Phenacohelix giveni** (77), **Delos coresia** (75), **Cavellia buccinella** (68), **Punctid n.sp. 29** (62), **Therasiella neozelanica** (62), **Tornatellinops novoseelandica** (58),r**Phrixgnathus ariel** (57),**'Mocella" sp 3** (57), **Phrixgnathus conella** (56), **Therasiella celinde** (53), **Huonodon pseudoleioda** (52), **Phrixgnathus fulguratus** (50), **'Mocella" 4** (49), **Cytora cytora** (49), **Laoma leimonias** (46), **Flammulina perdita** (45), **Charopa coma** (44), **Laoma cf marina** (44), **Huonodon hectori** (43), **Paralaoma lateumbilicata** (42), **Geminoropa cf cookiana** (36), **Laoma pirongiaensis** (37), **Phrixgnathus lucidus** (33), **Allodiscus urquharti** (33), **Punctid n.sp. 8** (32), **Laoma poecilosticta** (32), **Thalassohelix ziczag** (32), **Serpho kivi** (30), **Omphalorissa purchasi** (28), **Charopa pilsbryi** (25),**Therasiella tamora** (24), **Punctid n.sp. 55** (24), **Phenacohelix pilula** (23), **Obanella rimutaka** (22), **Pasmaditta jungermanniae** (22), **Laoma mariae** (21), **Fectola infecta** (21), **Phenacharopa pseudanguicula** (21), **Suteria ide** (21), **Therasiella cf neozelanica** (20), **Punctid n.sp. 32** (20), **Therasia decidua** (19), **Punctid n.sp. 1** (18), **Cytora hedleyi** (17), **Cavellia reeftonensis** (17), **Phrixgnathus serratocostatus** (17), **Laoma marina** (14), **Cytora septentrionale** (13), **Flammulina chiron** (13), **Paracharopa fuscosa** (12), **Paracharopa chrysaugeia** (12), **Chaureopa titirangiensis** (12), **Phrixgnathus glabriusculus** (12), **Phrixgnathus viridulus** (12), **Phrixgnathus cf lucidus** (12), **Allodiscus dimorphus** (12), **Flammocharopa costulata** (11),**'Mocella" sp. 1** (11) **Punctid n.sp. 6** (11), **Phrixgnathus cf ariel** (10),**Punctid n.sp. 7** (10), **Tornatellides subperforata** (10), **Pasmaditta miserabilis** (9), **Chaureopa microumbilicata** (9), **Cytora torquilla** (8), **Delos jeffreysiana** (8), **Allodiscus planulatus** (8), **Fectola unidentata** (7), **Punctid n.sp. 17** (7), **Phrixgnathus transitans** (7), **Fectola mira** (6), **Punctid n.sp. 30** (6), **Punctid n.sp. 5** (6), **Punctid n.sp. 40** (6), **Phenacohelix ponsonbyi** (6), **Phrixgnathus cf glabriusculus** (5), **Punctid n.sp. 43** (5), **Punctid cf n.sp. 7** (5), **Allodiscus miranda** (5), **Charopa montivaga** (5), **Phenacharopa cf pseudanguicula** (4), **Cavellia anguicula** (4), **Flammulina fereday** (4),

Therasiella serrata (3), **Flammulina cornea** (3), **Punctid n.sp. 69** (3), **Obanella cf rimutaka** (3), **Geminoropa vortex** (2), **Flammocharopa costulata a** (2), **Flammocharopa costulata c** (2), **Flammulina crebriflammis** (2), **Flammulina zebra** (2), **Pseudegestula transenna** (2), **Allodiscus tesselatus** (2), **Punctid n.sp. 38** (2), **Punctid cf n.sp. 55** (1), **Geminoropa huttoni** (1), **Pasmaditta cf jungermanniae** (1), **Rhytida dunniae** (1), **Delos cf coresia** (1), **Otoconcha dimidiata** (1), **Cytora chiltoni** (1), **Chaureopa hazelwoodi** (1), **Egestula egesta** (1), **Phenacohelix cf pilula** (1), **Laoma cf marina a** (1), **Punctid wairoa** (1), **Punctid ngaheretuku** (1), **Phrixgnathus moellendorffi** (1), **Punctid n.sp. 33** (1).

A list of snails mentioned in "Suters Manual", 1913, from South Auckland.

The present name appears in brackets where it is very different from Suters and * denotes that this is the closest I can come to a present equivalent

Thalassohelix zelandiae (I have synonymised it with **Therasia decidua** here).Waiheke (H.S. = Henry Suter) Howick, Maketu = Peach Hill Reserve, (M.B. = Major Broun). **Thalassohelix ziczag**, Mt. Wellington (Musson) Waiheke (H.S.) Tarukenga, Hunua Range (M.B.). **Allodiscus miranda** Hunua Range (M.B.). **Allodiscus urquharti** Hunua Range (M.B.), **Serpho kivi** Waiheke (H.S.) Hunua Range, **Therasia celinde** Waiheke (H.S.) Mt. Wellington, Hunua Range (M.B.) **Therasia tamora** Waiheke (H.S.), Mt. Wellington (Musson), Hunua (M.B.), **Phenacohelix pilula** Hunua Range (M.B.), Mt. Wellington, **Phenacohelix ponsonbyi** Waiheke (H.S.), Mt. Wellington, type, Hunua Range (M.B.). **Suteria ide** (H.S.). **Flammulina chiron** Mt. Wellington (Musson), Hunua (M.B.), **Flammulina costulata** Hunua Ranges (M.B.), **Flammulina feredayi** Hunua Ranges (M.B.), **Flammulina perdita** Auckland (Gillies), Hunua Ranges (M.B.), **Charopa pilsbryi** Mt. Wellington (H.S.), **Endodonta tau** (Fectola mira, Fectola infecta)* Auckland, Mt. Wellington, Hunua Range (M.B.), **Endodonta hectori** Mt. wellington, **Endodonta hunuaensis** (synon **Huonodon hectori**) Auckland (H.S.), Hunua (M.B.), **Endodonta pseudoleioda** Auckland, Waiheke, Hunua, **Endodonta anguicula** (**Phenacharopa pseudanguicula**) Mt. Wellington (H.S.), Hunua Range (M.B.), **Endodonta anguicula var. fuscosa** Hunua Range (M.B.), **Endodonta coma** Waiheke, vic. Auckland, **Endodonta egesta** Vic. of Auckland, **Endodonta buccinella** Mt. Wellington, Howick, Hunua Range, **Endodonta caputspinulae** (**Mocella eta**) North Is. from North Cape to Wellington, **Endodonta colensoi** (**Cavellia anguicula**)* Auckland **Endodonta irregularis** Auckland (I can't find this among the Auckland species), **Endodonta roseveari** (**Cavellia reeftonensis**) Waiheke (H.S.), **Endodonta tapirina** Auckland, Hunua Range, Maketu, (I can't find this amongst the Auckland species), **Endodonta corniculum** (**"Mocella" 4**)* Auckland, Howick, Hunua Range (M.B.), **Endodonta corniculum var. maculata** (**"Mocella" 3**), Motutapu (A. Suter) Hunua Range (M.B.) **Endodonta vortex var. microrhina** (**Geminoropa cf cookiana**) Mt Wellington (Musson), Hunua Range (M.B.), **Laoma leimonias** near Auckland, type (Greenwood), Howick, **Laoma marina** Remuera, Auckland, type (Cheeseman), Waiheke, Mt. Wellington, Hunua, form **albina**, perfectly white specimens from Auckland and the Hunua Ranges. **Laoma poecilosticta** Auckland (H.S.), Hunua Range (M.B.), **Laoma lucida** Auckland (Wright), **Laoma mariae** Waiheke, Hunua Range. **Laoma allochroida** (**Punctid n.sp. 7**)* Hunua Range (M.B.). **Laoma ariel** Auckland, type, Hunua Range. **Laoma conella** Auckland (Gillies), Mt, Wellington, Hunua Range 9M.B.). **Laoma celia** (**Phrixgnathus cf lucidus**)* Howick. **Laoma erigone** Auckland,type (Greenwood), Mt. Wellington lava fields Waiheke Is. Howick, Hunua Range (M.B.) **Laoma transitans** Hunua Range (M.B.) **Laoma lateumbilicata** Mt. Wellington (H.S.) **Laoma pumila** (**Paralaoma caputspinulae**) Mt. Wellington (Musson). **Tornatellina novoseelandica** near Auckland (Greenwood & co.), Hunua Range(M.B.). **Tornatellina subperforata** Auckland (H.S.) **Rhytida dunniae** Auckland (Gillies), Howick (M.B.). **Rhytida greenwoodi** Auckland, type, (Greenwood) Pukekohe (H.S.). **Lagochilus chiltoni var. septentrionale** Cowes Bay Waiheke, type, (H.S.). **Lagochilus cytora** Auckland, type (Greenwood), Howick, Hunua Range **Lagochilus hedleyi** Hunua Range, type (M.B.). **Lagochilus torquilum** Howick, type(M.B.), Hunua Range **Realia egea** Auckland, type (Greenwood), Hunua Range, Waiheke. **Realia carinella** Drury, Hunua Range. **Realia turriculata** Papakura (I don't think this is here though it might be hiding in the **egeas**). **Hydrocena purchasi** Auckland, Hunua Range. **Delos coresia** Motutapu (A. Suter), Waiheke (H.S.), Mt. Wellington lava fields (Musson), Hunua Range (M.B.).

About 61 species which represents about half of the present known species. Most of the early collectors names are now enshrined in species names.

A selection of reference material not already mentioned.

Revision of the Genus **Phenacohelix** —— R.A.Cumber Trans. Roy. Soc. Zool. 1961 Vol 1 No. 13, 165–196
Revision of the Genus **Therasiella** —— R.A.Cumber Trans. Roy. Soc. Zool. 1967 Vol. 10 No. 7, 61–70
Classification of N.Z. Arionacea II —— F.M.Climo Rec. Dom. Mus. 1969 Vol. 6 No. 14, 175–258.
Classification of N.Z. Arionacea III—— F.M.Climo Rec. Dom. Mus. 1970 Vol.6 No. 18 , 285–366.
Review of Charopine Snails with Lamellate Apertures - F.M.Climo Rec. Nat. Mus. 1978 Vol. 1 No. 12 177–201
The new Genus **Paracharopa** —— F.M.Climo Rec. Nat. Mus. 1983 Vol.2 No. 14, 151–161.
The new Genus **Chaureopa** —— F.M.Climo N.Z. Jour. Zool. 1985 Vol. 12 283– 296.
Sympatric species diversity of N.Z. Landsnails Solem, Climo & Roscoe. N.Z. Jour. Zool. 1981 vol.8 453–485
Notes on the introduced terresrial mollusca of N.Z. - G.M.Barker J. moll Stud. (1982) 48 174–181
N.Z. Mollusca A.W.B. Powell 1979
A distributional guide to the Operculate Landsnails, Genus **Cytora**. N.W.Gardner, Conch. Sect. Auck. Inst. & Mus. limited Bulletin Jul. 1979.

Further Records of Mactra (Cyclomactra) tristis (Reeve, 1854)

B.F.Hazelwood

Since Norman Douglas' article in Poirieria, collectors have increasingly become aware of this secretive estuarine bivalve. At present, tristis (=rudis) is listed as a subspecies of ovata, within the subgenus Cyclomactra. There is considerable debate regarding the true status of tristis. Ovata and tristis are never found living together, although in some localities, both have been found occupying the same mud beds. These, however, are subfossil and most likely would have inhabited the area at different times. Both "forms" are not geographically separated, but prefer a different substrate and station. This evidence would invalidate the present subspecies ranking. However, with more information, tristis could prove to be a full species in its own right, or maybe only an ecotype.

Tristis is found in association with a fresh water influence, upstream from a river mouth, or a fresh water inlet into a harbour. The salt content of this water is considerably diluted.
Ovata prefers low tidal mud flats in harbours or estuaries.
Live specimens are known from the following localities: Waiuku, Thames, Whakatane, & Waikanae river mouth.

Until Norman Douglas' report, the species was regarded as sub-fossil only. Many localities turned up single valves only. A few sites show evidence of earthquake upheaval leaving the beds stranded, entombed in hardened black mud.

All present literature referring to the sub-genus Cyclomactra, names three species, one being in synonymy:

C. ovata ovata	Recent
C. ovata tristis	Recent
C. ovata tristis =rudis	Fossil - Pliocene, Whangaroa Harbour

Records of tristis to date:

South Island

Westhaven Inlet, Nelson................Uplifted beds (subfossil)

Heathcote Estuary, Canterbury..........Oliver, 11/4/1911

Mudflats, Rough Island, Nelson.........F.M.Climo, 10/10/1969

Ocean Beach, Rabbit Island, Nelson......A.M.Giffney (mixed lot)

North Island

Paraparaumu............................Graeme Davies
(live specimens)

north of Old Waimeta? Stream
at confluence with Waikanae River.......C.A.Fleming

upstream Waikanae River ..............B.F.Hazelwood, 3/3/1983
(live specimens)

Otaki Beach............................B.F.Hazelwood

Kuku Beach............................B.F.Hazelwood
between Manakau and Ohau,
Horowhenua
(No live specimens yet, exposed beds uplifted by seismic activity)

Foxton Estuary.........................Betty Wolf

Foxton Estuary.........................B.F.Hazelwood &
Charlie Brunning,
3/4/1983

Tangimoana Beach, Bulls................B.F.Hazelwood
(single valves)

Lake Ferry Spit........................Ponder Collection, 1957

near Landguard Bluff,
Wanganui River.........................Betty Andrews

near Landguard Bluff,
Wanganui River.........................B.F.Hazelwood, 20/3/1983
(uplifted beds)

mud flats, Whakatane River,
near mouth.............................B.A.Marshall M32566
Dec 1969 (live)

Thames (bay north of Thames)...........B.F.Hazelwood

various localities around Waiuku........N.Douglas

Turanga Creek, Whitford, Auckland......Dell Collection
(in brackish water)

Half a Lifetime on the Mahurangi River

Bob Penniket

We came to this district in 1953. During the first year or so we settled in, got to know the area geographically, its scenery, climate and people. It was all very beautiful: quiet, peaceful, natural - almost as it always had been. Sure the prehistoric forests down to the waters edge had gone. Trees from around the world were on the farms, second growth forest, gorse and manuka on the steeper slopes and poorer land, pohutukawa on the cliffs. Still, the sea was not too spoilt - 35 years ago.

Not now though. Inshore fishing is ruined. Beach settlements, crowded beaches, crowded beaches with fizz boats, sailboats, sailboards - all inevitable I suppose, and unstoppable. I call it Pressure of Population. Kawau Island suffers a little less. Not so easy of access and the permanent residents do what they can to protect it from the worst abuses. Our mainland coast has changed most - "only an hour from the Bridge you know". Sandspit, Snells, Algies, Martins Bay - "so safe for the children" - ideal for John Citizen and his family, and who can blame him or say no ?

But there is a price - the Environment! As an example, the Mahurangi River. I have monitored our river for thirty five years. Warkworth town to Saddle Island, and kept note of its marine life, in particular its molluscs. It is still a placid waterway, but it is being progressively modified by runoff from roads (oil and petrol residues, road and tyre dust) outfall from sewage systems and dumps, runoff from farms (fertilisers, sprays, animal wastes, silt after heavy rains, cultivation, and much, much more. The river has changed from the clear limpid waters so well described by earliest settlers.

We can still harvest oysters that pass for human consumption, people can still swim without apparent harm. I will still eat scallops from the lower reaches, away from the pollution up river. On Cernell Island I could at one time have a choice of forty or fifty <u>Cabestana spengleri</u> when I wanted one for exchange - but not now. The rocks they lived on, and under, are bare of sheltering algae, and their food has gone. Not one is to be found. <u>Penions</u> were once plentiful at Opahi Bay - none, last time I looked.

<u>Struthiolaria</u> and <u>Pelicaria</u> are still there, but in greatly reduced numbers. <u>Cellana</u> species almost all gone from where they were common. The snake chiton, <u>Sypharochiton peleserpentis</u> is small now, and poor and scarce. Oysters, <u>Crassostrea glomerata</u> and particular <u>Crassostrea gigas</u> thrive in the lower reaches so <u>all</u> is not bad, but <u>Maurea pellucida</u> once there but uncommon, is not there at all. Years ago I even found <u>Maurea tigris</u> but not now.

Oyster borers Lepsiella scobina, at one time in thousands, feeding on barnacles, and the subject of a Government bounty to protect the oyster industry, is becoming unusual in these parts. Even the hardy algae Homosira banksii is small and poor.

What can we do about it? Not much, as I see it. We can't halt progress, can we? We can't forbid people to come and enjoy the sea shore. Any preaching is heeded only by the converted. There is a call for Marine Reserves of 10% of our coast. A great idea, but so far only a great idea. It will be almost impossible to police. Local gossip tells of raiding of what we already have. Any ideas?

WANTED

The National Museum would like to obtain complete or partial sets of "Auckland Museum Conchology Club/Section Newsletter" and associated pages covering the years 1946-1957. Although their set is more or less complete, Bruce Marshall would like to complete it for binding. Unfortunately most pages associated with the "Newsletter" were undated, and it is impossible to be certain precisely when many of them were published. Accordingly, while anything will do, Newsletters and associated pages that were stapled or otherwise attached together upon receipt would be of the greatest value. If necessary the National Museum is prepared to pay or exchange for this material. **Please address correspondence to: Mr Bruce Marshall, Department of Malacology, National Museum of New Zealand, P.O. Box 467, Wellington.**

In trying to put this lot in order, I note that recent issues of the "Newsletter" do not show the year of publication. Since this is important for bibliophiles such as myself, I strongly recommend that you ensure that the year of publication is shown on all of your publications.

Species found on Takapuna Beach (1983 -1990)

John Murphy

Chitons:

Ischnochiton maorianus	(Iredale, 1914)
Amaurochiton glaucus	(Gray 1828)
Acanthochiton zelandica	(Quoy & Gaimard, 1835)
Sypharochiton peleserpentis	(Quoy & Gaimard, 1835)
Sypharochiton sinclairi	(Gray, 1843)
Terenochiton inquinatus	(Reeve,1847)
Callochiton crocinus	(Reeve,1847)

(The above were collected by Bruce Hazelwood)

Other Species:

Cellana ornata	(Dillwyn, 1817)
Cellana radians	(Gmelin, 1791)
Maoricrypta (Zeacrypta) monoxyla	(Lesson, 1831)
Littorina unifasciata antipodum	(Phillipi, 1841)
Rissoina chathamensis	(Hutton, 1873)
Nerita melanotragus	(E.A.Smith, 1884)
Trochus tiaratus	(Quoy & Gaimard, 1834)
Herpetopoma bella	(Hutton, 1873)
Cookia sulcata	(Gmelin, 1791)
Scutus breviculus	(Blainville, 1817)
Eationella (Pellax) huttoni	(Pilsbry, 1888)
Eationella (Dardanula) olivacea	(Hutton, 1882)
Diloma bicanaliculata	(Dunke, 1844)
Maurea pellucida	(Valenciennes, 1846)
Struthiolaria vermis	(Martyn, 1784)
Struthiolaria papulosa	(Martyn, 1784)
Thais orbita	(Gmelin, 1791)
Muricopsis octogonus	(Quoy & Gaimard, 1833)
Xymene traversi	(Hutton, 1873)
Cominella quoyana	(A.Adams, 1854)
Cominella virgata	(H.& E.Adams, 1853)
Buccinulum lineum	(Martyn,1784)
Austrofusus glans	(Roeding, 1798)
Neoguraleus sinclairi	(Gillies, 1882)
Taron dubius	(Hutton, 1878)
Sigapatella novazelandiae	(Lesson,1831)
Serpulorbis zelandicus	(Quoy & Gaimard, 1834)
Thoristella oppressa	(Hutton, 1878)
Siliquaria weldii	(Tennison-Woods, 1876)
Amalda australis	(Sowerby, 1830)
Amalda mucronata	(Sowerby, 1830)

Bulla quoyi	(Gray, 1843)
Cominella maculosa	(Martyn, 1784)
Haustrum haustorium	(Gmelin, 1791)
Maoricolpus roseus	(Quoy & Gaimard, 1834)
Alcithoe arabica	(Finlay, 1927)
Micrelenchus dilatatus	(Sowerby, 1820)
Diloma arida	(Finlay, 1927)
Felaniella zelandica	(Gray, 1835)
Diplodonta globus	(Finlay, 1927)
Chlamys zeelandona	(Hertlein, 1931)
Chlamys zelandiae	(Gray, 1835)
Pecten novaezelandiae	(Reeve, 1853)
Zearcopagia disculus	(Deshayes, 1855)
Protothaca crassicosta	(Deshayes, 1835)
Tawera spissa	(Deshayes, 1835)
Venerupis (Paphirus) largillierti	(Phillipi, 1849)
Dosinia zelandica	(Gray, 1835)
Dosinia lambata	(Gould, 1850)
Venericardia purpurata	(Deshayes, 1854)
Bassina yatei	(Gray, 1835)
Atrina zelandica	(Gray, 1835)
Anomia trigonopsis	(Hutton, 1877)
Notopaphia elegans	(Deshayes, 1854)
Myllita stowei	(Hutton, 1873)
Corbula zelandica	(Quoy & Gaimard, 1834)
Glycymeris laticostata	(Quoy & Gaimard, 1835)
Acar sandersonae	(Powell, 1933)
Barbatia novaezelandiae	(E.A.Smith, 1915)
Longimatra elongata	(Quoy & Gaimard, 1835)
Mactra (Cyclomactra) ovata ovata	(Gray, 1843)
Modiolus areolatus	(Gould, 1850)
Anchomasa similis	(Gray, 1835)
Crassostrea glomerata	(Gould, 1850)
Limaria orientalis	(Adams & Reeve, 1850)
Xenostrobus pulex	(Lamark, 1819)
Mytilus edulis aoteanus	(Powell, 1958)
Xenostrobus securis	(Lamark, 1819)
Xymene ambiguus	(Phillipi, 1844)
Umbonium (Zethalia) zelandica	(Finlay, 1927)
Cabestana spengleri	(Perry, 1811)
Risellopsis varia	(Hutton, 1873)
Marginella pygmaea	(Sowerby, 1846)
Paratrophon quoyi	(Reeve, 1846)

THE NEW ZEALAND LANDSNAIL FAUNA B F Hazelwood

Due to the reduction of forests and natural habitats, our fantastic landsnail fauna is facing disaster. Also the "greenhouse effect" poses an added threat.

The importance of New Zealand landsnails has been introduced by Solen, Climo and Roscoe (1981). They put the number of described species at 315 with at least 205 species awaiting description. At the Manakau Peninsular they recorded 60 species living sympatrically in one patch of bush; with a possibility of 89 species from the region. This is a much greater species tally than anywhere else in the world. This excludes other regions of New Zealand where species lists can reach over 40 species sympatrically and approximately 100 species from the region. This fauna is vastly larger than any of us would have expected.

Dr Frank Climo works fulltime on NZ landsnails at the National Museum in Wellington. We are very fortunate because this vast fauna has to be described quickly. This is added ammunition for the conservation lobby in trying to save regional sections of native bush, wetlands, and shore belts. Any patch of bush can maintain a sizeable fauna of snail and insect life.

Of the species described, none as yet have become extinct; although some are exceedingly rare and localised. Many of the unnamed species are in restricted areas and are also endangered.

The interpretation of taxonomy based on panbiogeographical beliefs is a new faze that has been entered into; still to be proven, but undoubtedly correct. This helps in tracing the ancestry of NZ snails. Panbiogeography is the separation of land due to continental drift from the former continent of Gondwanaland. The different elements of our fauna, it is suggested, have always been here due to "tectonic rafting". Our fauna shows affinities with some Australian, Pacific and South American snails. How this happened has to be proven. Modern distribution is due to geological barriers - mountain ranges, earth movements, glaciations, rivers, rainfall, altitude, former land distribution, and separation of islands; resulting in endemic flora and fauna zones. Many plant-altitude-snail associations exist in combination with natural barriers to produce areas of high endemism. These are now known as nodes in pangeographic language. I will not go into the details of this here but rather leave that to Dr Climo.

I would stress, though, that external and internal influences mould the evolution of our flora and fauna. On a global scale snail Families and Genera still have to be determined. The past work has mainly been done with a parochial bias. Variation, distribution, and evolution of species is only now being recognised now that we have a broad data base to work from.

The Neo-Zelanic region includes the following: the Subantarctic Islands, North Island, South Island, Stewart Island, the Three Kings Islands, and the Kermadec Islands. Local variation is most pronounced when viewing this region as a whole; as patterns of distribution occur time and time again. Tracks plot the distribution patterns of species and indicate the ancestry of our

present snails. Knowledge has come of age! My only fear is that it may be too late by the time our fauna is eventually put to paper.

Some of our snails from caves appear to be already extinct, disappearing approximately 100 - 200 years ago; and many or these are unnamed. Similarly, snails from limestone and marble regions also contain extinct endemic species, and these shells can only be found in such calcium-rich formations. Finally sand hill subfossil deposits also produce shore belt species and forms closely related to present coastal flax populations.

We must save all these habitats and record them thoroughly. They are a natural treasure. We are only guardians of this planet and we <u>must</u> endeavour to maintain all living life forms regardless of how insignificant they seem or how lacking in commercial value they are. This is our legacy.

NOTE:
The New Zealand element in the Kermadec Island fauna is thought to have arrived via wind and/or seabirds; as the Kermadecs are very recent on the geological time scale being volcanic in origin.

TWO LIVE BEARING FRESHWATER SNAILS FROM NEW ZEALAND AQUARIUMS

by B F Hazelwood   Illustrations by J Gouldstone

Species 1: I have five adult specimens in my cold water fish tank. They have been breeding during January - March and have produced over 70 baby snails.

Species 2: These are from tropical tanks at Aquazoo Pet Shop, Ellerslie. They seem to be in the same genus as the last, but are more sharply angled and are consistently smaller. They are prolific breeders.(personal comment)

I do not know if these are separate species, but they are clearly from the same genus.

Species 1
(7 by 15.5mm)

Species 1 (juvenile)
(1.5 by 4mm)

Species 2
(6.5 by 18mm)

FOSSIL COLLECTING SOUTH OF KAIKOURA

By Bev Elliot

Although there are no worthwhile fossil localities that I know of close to Kaikoura, there are two places further south which are interesting. In January 1988, while exploring the district, I drove to the end of the road at Medina, 23 miles as the crow flies south of Kaikoura (but somewhat further by road). I noted the interesting looking creeks and cliffs at Ploughman Creek and Big Bush Gully as I passed, and decided to explore further on my way back. I never thought of fossils, it was just scenery I was seeking; but as soon as I reached the beach at Big Bush Gully I noticed many Stiracolpus symmetricus in the clay cliffs, and when I found my first Cominella marlboroughensis I was eager to see what else was to be found there, and ended up with 17 species of shells. Three further visits have added another 10 species to the list, plus more and better specimens of those found that first day.

Stiracolpus symmetricus - by far the commonest species (100's)
Cominella marlboroughensis - very common and in good condition
Chlamys delicatula - single valves common; occasionally paired
Paphirus largillierti - singles and pairs, usually fragmented
Tawera spissa and Pleuromeris zelandica - single valves only
Less common are:
Modiolus areolatus (one valve) Perna canaliculus (fragments)
Aulacomya maoriana (fragments) Zenatia acinaces (fragments)
Anchomasa similis (fragments) Nemocardium pulchellum (fragments)
Scalpomactra scalpellum (one complete) plus some very tiny bivalves

Zeatrophon ambiguus - 3	Micrelenchus huttoni - 2
Axymene sp - 5	Maurea punctulata - 1
Xymene plebeius - 1	Trochus tiaratus - 1
Buccinulum littorinoides - 2	Falsilunatia powelli - 3
Zegalerus tenuis - 1	small turrids - 11
??Cominella iredalei - 1	and pieces of crab claws

Ploughman Creek, a mile north, although it looked equally interesting, had almost nothing to offer except a couple of Umbonium zelandica and a piece of Neilo.

Medina, a mile south, had only a very small fossil bed; with the most interesting species there being:

Leucotina ambigua - 7	Amalda depressa - 2
Austrofusus glans - 8	Paratrophon patens - 2
Maurea selecta - 1	Xymenella pusilla - 8
Tanea zelandica - 1	Argobuccinum - 1 poor
Amalda australis - 1	Rissoids - 3

Chlamys gemmulata - many, but too fragile to collect

While roaming the coast at Claverly, 15 miles south of Kaikoura, I met up with a friendly farmer who told me about the fossils on his farm, and urged me to come and have a look. On my first visit he took me up to the fossils on his four wheeled motorbike, a thrill I was only too glad to do without on my second visit!

Glenstrae does not look at all interesting - just a slip at the top of a hill - but while other similar looking slips nearby yield nothing at all, here in one little corner is a wealth of deepwater fauna. Again Cominella marlboroughensis were very common and in good condition; followed by Aeneator valedictus usually damaged. Chlamys delicatula were not so common here and usually in fragments; and there were single valves of Venericardia purpurata Scraps and fragments were found of:

Ostrea sp	Maoricolpus
Glycymeris laticostata	Stiracolpus symmetricus
Glycymeris modesta	Zegalerus tenuis
Tawera spissa	Alcithoe
Scalpomactra	Penion
Neilo	Nucula
Pallium convexum	one Modelia operculum

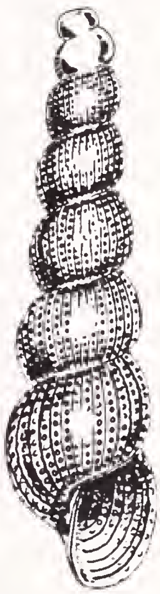
Brachiopods Liothyrella and Terebratella sanguinea
One small cup coral, and pieces of crab claw.
Deep water species found were numerous small turrids, including lots of Splendrilla, one Maoritomella, and several Comitas onokeana, the largest a beauty of 43mm. Over 40 specimens of Falsilunatia powelli were found up to 20mm in size. Others were:
Pleuromeris zelandica (numerous single valves)

Pleuromeris marshalli - 1	Galeodea sp - 1 broken
Cantharus valkyrie - 1	?Ellicea recens - 1 broken

Bonellitia sp - a perfect little 10mm beauty
Plus finally a complete little 12mm bivalve which appears to belong to the Lucinidae or maybe the Gonimyrtea.

Graphis blanda (Finlay 1924) by Margaret Morley

This is number three in the "Visible Evidence" series; that is species not illustrated by A W B Powell. The specimen shown was found in shell sand from Oneroa, Waiheke Island on 8 August 1987. The only other Graphis blanda I have in my collection was found in shell sand from Wenderholm on 21 September 1987. Finlay described it as follows: "shell small, subulate, very thin and fragile, subdiaphanous and subperforate. About 26 slender flexuous axial ribs on penultimate whorl, curved slightly outwards medially, vanishing towards aperture on base (though not suddenly truncated), interstices slightly wider. Ribs regularly convex and smooth, but interstices bear very fine and dense radial riblets, about 15 on penultimate whorl, with linear interstices so that the effect of fine beading between the axials is produced. Inside aperture riblets are distinctly visible through translucent test.....Colour pale horn. Spire acicular.....protoconch heterostophe. Whorls 9."



1.7mm
(type 3mm)

ITEMS OF INTEREST

- In "Rossiniana" October 1989 Georges Richard and Robert G Moolenbeek described two new Conus species from deep water off New Caledonia; Conus plinthis and Conus richerti. This is of interest because Conus plinthis is also found off Northern New Zealand. One specimen was dredged at 844m from the Northern Three Kings Rise; and two specimens were dredged at 135m and 154m from Raoul Island. This species is 17.2 to 43.9mm in size and is white with brown spiral lines, most of them connected by brown axials; and with an irregular brownish band 3/4 of the way up the body whorl.

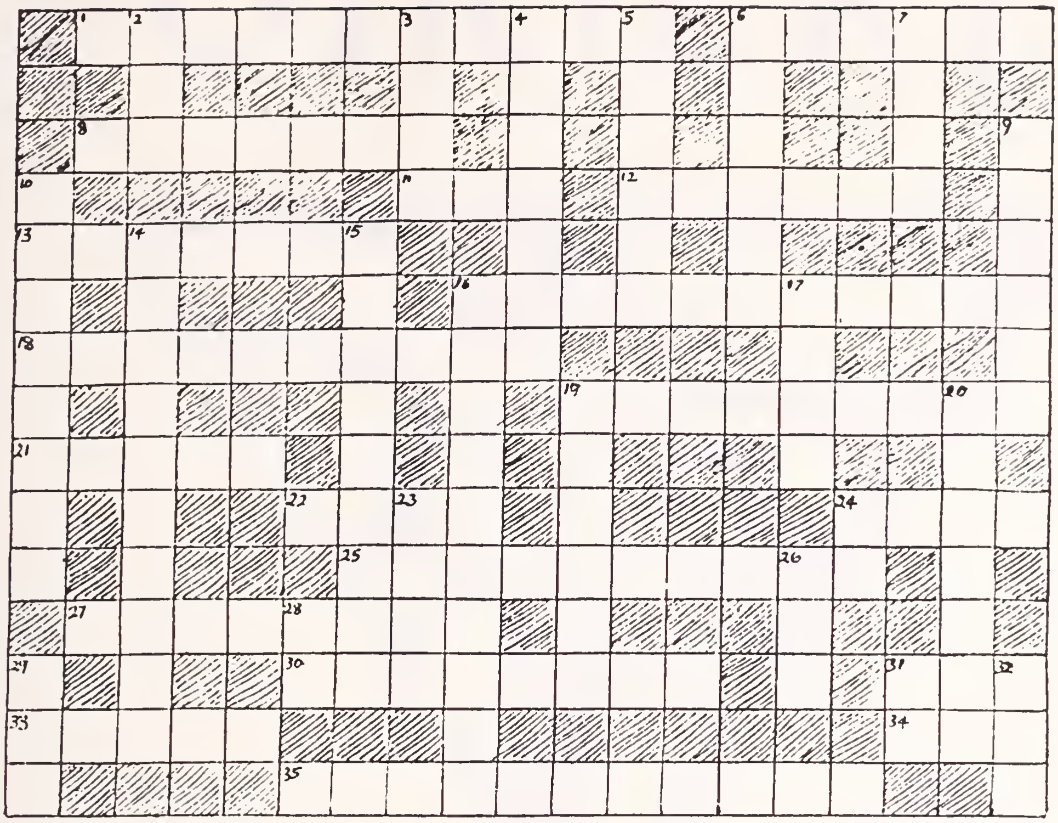
- In "J. Moll. Stud.(1987), 53, 121-127" B A Marshall described a new family of limpets associated with whale bone in the deep-sea calling them the Osteopeltidae. He described Osteopelta mirabilis trawled off the Chatham Rise and off the Chatham Islands at 880--882 and 937-955m respectively. The shell is up to 8.1mm long, is white, rather thin, and fragile.

- D Crosby writes that on 6 January 1990 while diving in about 10m of water in Smugglers Bay, Whangarei Heads he collected a nice live specimen of Struthiolaria vermis measuring 48mm. While cleaning and removing the animal he found about 10 juvenile specimens measuring about 3mm (several were damaged before he realised what they were). These juveniles appeared to be well inside the shell - somewhere near where soft and firm parts of the animal join.

On a second dive that day in approximately 25m of water near "The Old Woman", Whangarei Heads he observed for the second time Buccinulum linea laying eggs. (The first time was at this same location on 13 May 1989). Eggs were creamy white, oval, about 4 by 2mm, and were being deposited in a cluster around the finger of the finger sponge Callyspongia ramosa. Eggs were being attached radially in succession; each subsequent ring attached to the previous one, with about 5 rings of eggs laid. Nearby was a much larger cluster of eggs with no adults in the vicinity. The shell laying the eggs was about 30mm in size.

- A W B Powell recorded Volva longirostrata as being found on gorgonians at 50m at the Poor Knights Islands. In fact the shells he figured belong to the closely allied Phenacovolva wakayamaensis. The terminals of P. wakayamaensis are longitudinally aligned and not striate; the body whorl is more elongate, thinner and not medially humped. It has a slender rod-like labrum, whereas that of P. longirostrata is ventrally flattened and swollen centrally. P. wakayamaensis was described by Cate and Azuma in 1973.

CROSSWORD



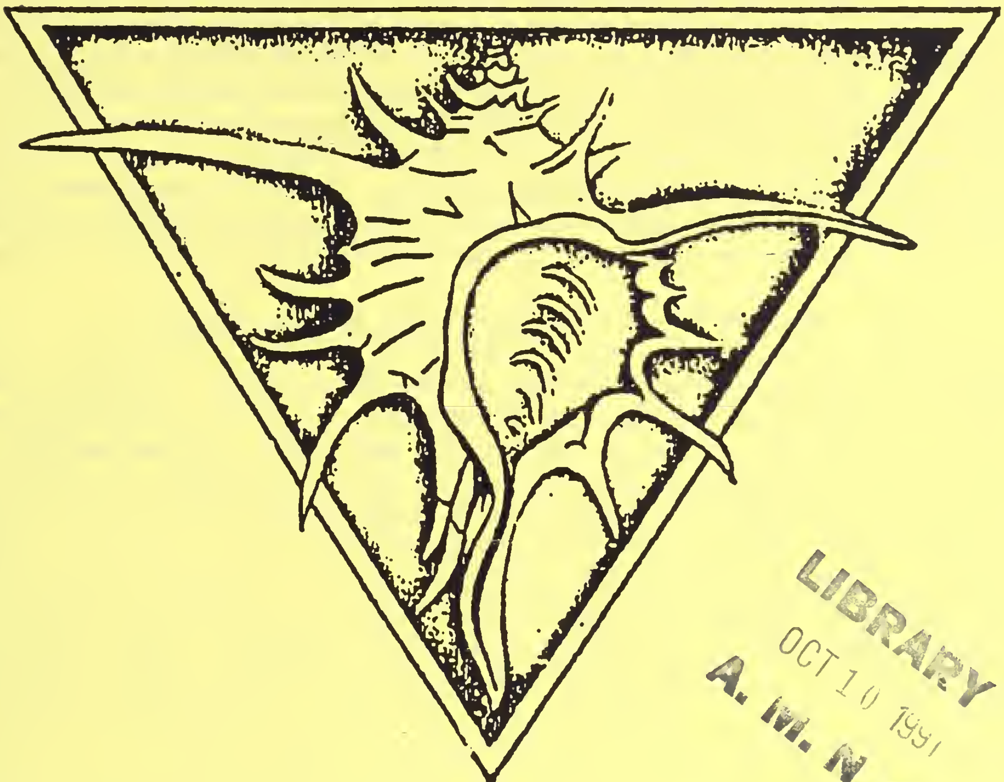
Across

1 A holy shell?
6+33 Bivalve found in soft mud
8 Our commonest chiton species?
11 Common name for trochid shells
12 One of our few arboreal snails
13 This species is a deep water member of the Muricidae
16 Circular shells found on the underside of rocks
18 A Japanese import
19 You never know what this shell is carrying
21 This bivalve genus was revised by Marshall
22 Something sandflies do
24 Parengarenga accomodation
25 Large fragile bivalve species
27 A difficult to obtain species of Harpa
30 A small crimson trochid
31 Small deep water turrid
33 See 6 across
34 Was backward!
35 New name for dilatatus

Down

2 Makes shells shiny
3 Record of what shells you have
4 This species of Siphonaria was once called cookiana
5 You could go on forever with different patterns of these
6 Sponge eating trochid
7 Favourite food of Polynesians
9 Proper name for dorsal appendages found in Aeolids
10 A volute named by Dell
14 A deep water bivalve
15+16 This small bivalve can open out 180° and crawl away
17 Got from wise old collectors
19 A common carnivorous genus
20 Used to be Mayena
23 Fish have them but not shells!
24 What you say for a gift
26 Bird and rare deep water shell
28 L hophaga - missing letters
29 Highly prized when yellow
31 You and me
32 Initials of our guru

POIRIERIA



Auckland Museum
Conchology Section

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EDITORIAL:

With small endemic New Zealand landsnails, it seems to be a race to classify them before they become extinct. Because of their small size they have not hit the conservation headlines, and several species have probably already quietly "passed away" without being recognized by mankind. The opportunities for amateurs to work in this field are plentiful, and we are fortunate in our club in having several members making their own unique contribution to the knowledge of this fauna - two of their articles appear in this issue.

In the marine area we are far less likely to uncover new species, but we can still make valuable scientific contributions by recording information on the live animals we see. Margaret Morley's observations on Turbonilla in this issue are the sort of thing we should all be doing, as there is very little known about the ecology of most endemic species. Also, collecting information instead of specimens is in the long term probably more rewarding.

Ian Scott
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TABLE OF CONTENTS:

LANDSNAILS FROM GREAT BARRIER ISLAND -- January 1981.

Intoduction

This is a brief report of four days collecting on the island and is a natural extension of my work on the Coromandel Peninsular. The sections of bush which I traversed all showed signs of extensive logging in the past and much of it may even have been burned. I believe that a large area of Ti-tree adjacent to the Kaitoke swamp was once farmed and this would correspond to sites 18 - 23 in my sampling. There were some patches of better looking bush around the Kaiarara Hut but I didn't really do it justice owing to shortage of time and poor weather.

In 1979 I had some leaf mould from the Kaiarara Hut (see site 5) and it yield- some small,tall spired Laoma marina reminiscent of the northern ones, but they failed to turn up on this trip; instead all the specimens I found were identical with those found at Port Jackson and Moehau.

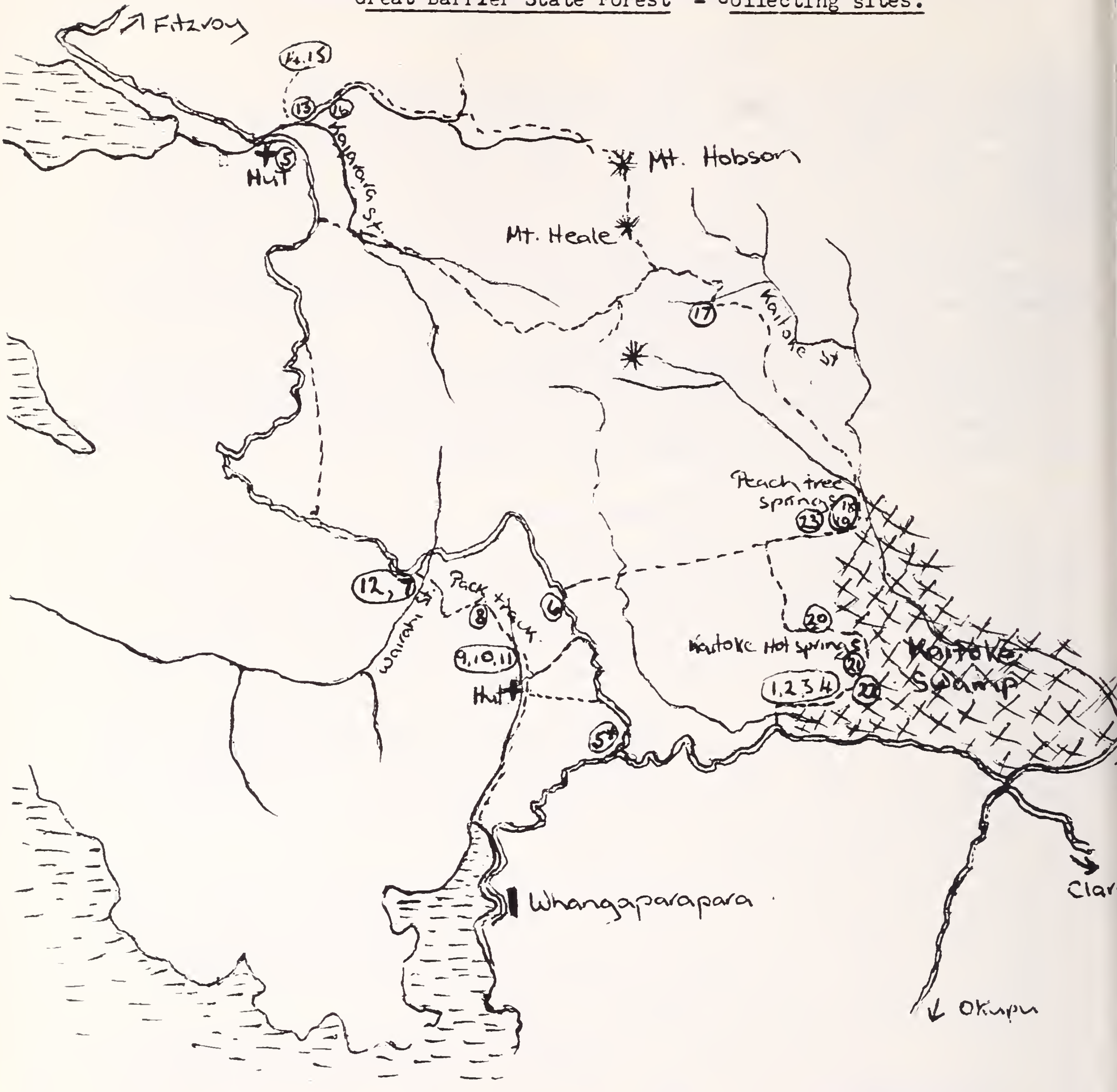
I did not find enough Laoma pirongiaensis to properly compare with those on Moehau though the two I did find tended to be more rounded than the Hunua specimens.

Overall I found a total of 54 species,perhaps the most pleasing aspect being the re-discovery of Laoma alfredi a species evidently not seen since it was originally collected by Alfred Suter at Birkenhead, Auckland.

List of Collecting Sites.

1. The first section of bush along the Kaitoke Hot Springs track, within 200m of the road, under Puriri and Tawa. 1 litre of leaf mould.
2. Close to last under Tawa and Nikau. 1lt. leaf mould. In amongst rocks.
3. Close to last under Puriri and Ti-tree, 2lts. leaf mould.
4. Collected on the spot from Nikau fronds along this first 200m of the Kaitoke Springs track.
5. At the top of the hill on the road between Claris and Whangaparapara, where the Fitzroy Forestry road joins it I found 1 Therasiella neozelanica (Cumber). I have not included this single specimen, found under Titree, in the Table but have here substituted those snails found in a sample of leaf mould (2 lts.) collected immediately behind the Kaiarara Hut by my son John in 1979.
6. On the Forestry road just north of the junction with the Kaitoke Hot Springs track under a fallen rotting epiphyte. 1 lt. l.m.
7. Just before the Pack Track meets the Forestry road it crosses a stream by the remains of a dam. This site was just above the dam in a grove of Nikaus. 1 lt. l.m.
8. 1 litre of leaf mould taken from under a young Rimu at the top of the ridge on the Pack Track. There were a lot of young Kauris here and it was quite dry.
9. Under an old Rimu not far above the Whangaparapara Hut on the Pack Track. 1lt. l.m.
10. Close to the last spot under Tawa, 1 lt. l.m.
11. In the same area as 9 & 10 these were collected on the spot mostly in fallen Nikau fronds. I collected 4 shells of Schizoglossa novoseelandica barrierensis here put them in my pocket because all my tubes were too small and subsequently lost them. Hamish Spencer has also reported them to be common around the Whangaparapara Hut.
12. These were collected on the spot from the Nikaus of site 7.
13. Collected on the spot from Nikau fronds along the Selwyn Track --Kaiarara Hut.
14. 1 litre of leaf mould taken from under a Puriri at the end of the Selwyn track where it peters out.
15. Same as last under a different Puriri.
16. Kaiarara Hut. 1 litre of leaf mould taken under Taraire alongside the track to the dams and close to the stream. Not far along.
17. The track from the Kaiarara Hut to the Kaitoke Springs reaches its highest point on the flank of Mt. Heale then descends sharply to cross a small steep tributary of the Kaitoke stream. Because we camped one night here I spent quite a lot of time collecting in this somewhat barren spot, consisting of thin Titree with a carpet of Blechnum capense underneath. Nearly all the snails were collected on the steep rocky side of the stream where water was seeping out amongst rushes, astelia and blechnum.
18. Between Peach Tree and Kaitoke Hot Springs the vegetation is all secondary Titree. but at one point along a small stream some larger trees have been left.

Great Barrier State Forest - Collecting sites.

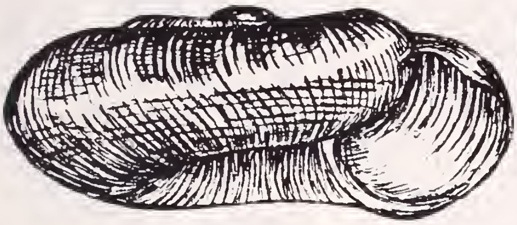


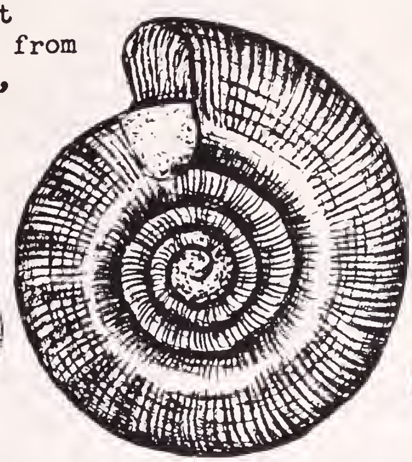
1 litre of leaf mould was taken here from the base of a large Rimu.
19. A few meters from the last site another litre of l. m. was takenunder a mixture of Rimu and Taraire.
20. Alongside the Kaitoke Springs the bracken is particularly luxuriant owing no doubt to the warm ground and Pohutukawas spread overhead. I took 1 lt. of l.m. from amongst the bracken but it yielded nothing-- perhaps the strong sulphur fumes are an inhibiting factor.
21. Between Kaitoke Springs and the road in a section of track lined by an old fence where the Titree is dense I took 1 lt. l.m. from a rotting log.
22. This sample of leaf mould - 1 lt. - was taken close to sites 1 - 4 but four days later on the return trip. It was gathered under a grove of Taraire.
23. Collected on the spot around the Peach Tree Springs from fallen Nikau fronds.

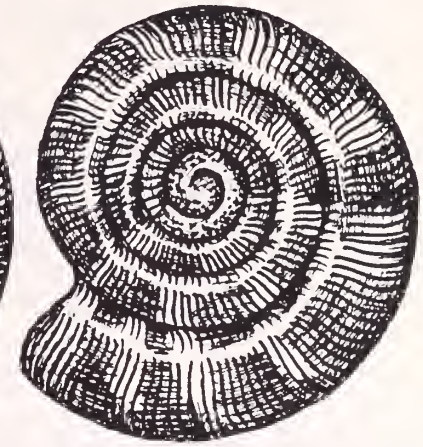
Illustrations of Species

I have only drawn those species not illustrated in the Coromandel Report though I have sometimes drawn a"new" one before I realize that I have seen it before.

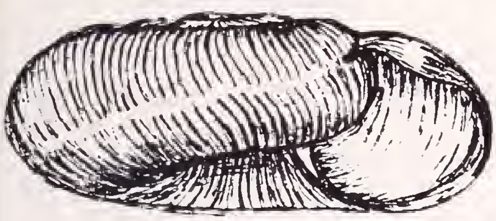
Charopa transenna (Suter). I have not recorded this species at all in the Coromandels and have only seen it from the Waitakeres. I only found one specimen at site 13 but it closely resembled my samples from the type locality - Walkers Bush, Waitakere.
2.6 x 1.2 mm.

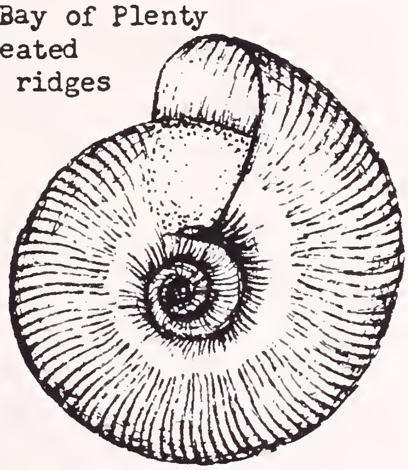


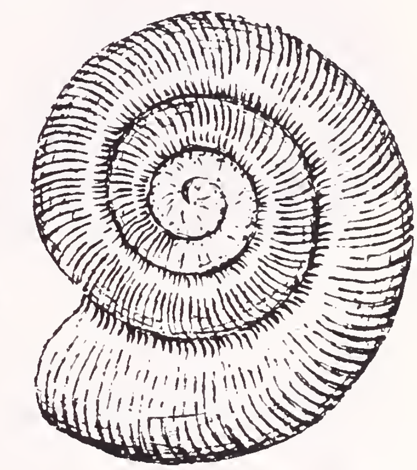




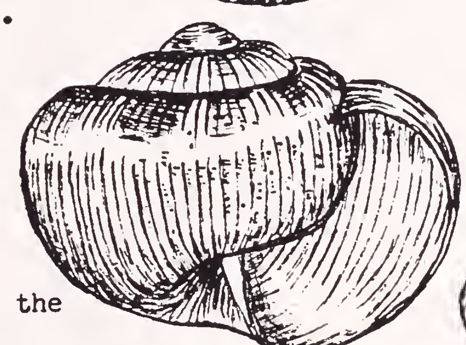
Charopa sp. This is the same shell illustrated on page 18 of the Coromandel Report. Again I only found one specimen at site 6. Of the original specimen from Coromandel F.M.Climo wrote (in a letter dated 11/10/79)
"It is a specimen of that new Bay of Plenty Paracharopa - dull weakly malleated protoconch with obsolete axial ridges and a rich brown teleoconch."
2 mm. x 0.9 mm.

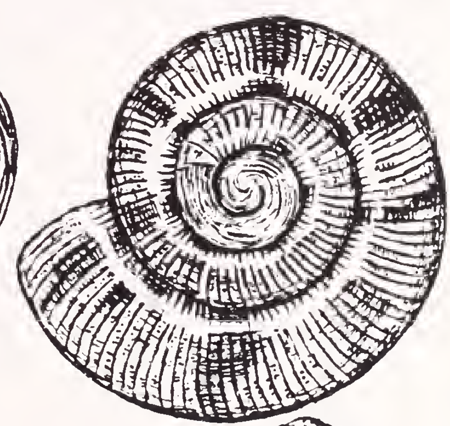






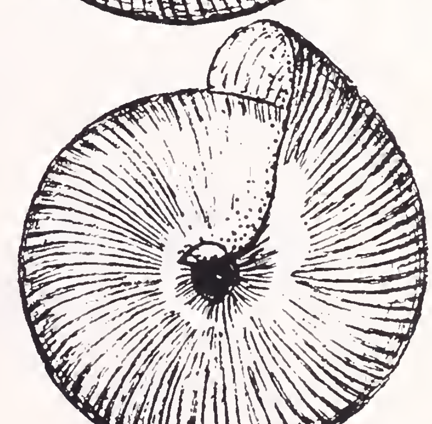
Allodiscus mossi (Murdoch). I havent seen this one before and have named it tentatively for the moment. Two specimens were found in a wet situatinn at site 17, one was a juvenile the other old. The older one had a raised callous just inside the lower lip of the aperture.
2.4 x 1.8 mm →



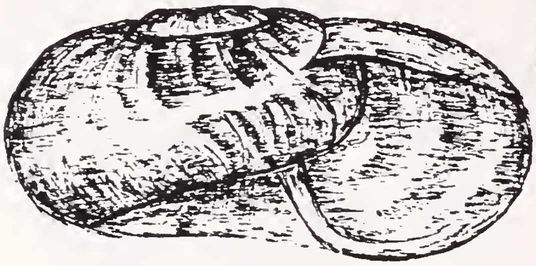
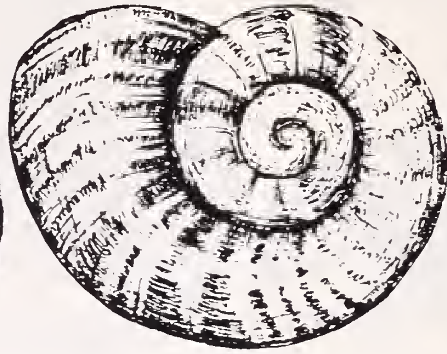


Many snail shells look very different in the juvenile stages and this has no doubt led to some faulty identifications particularly with fossil or semi fossil specimens which only have shape to go on.

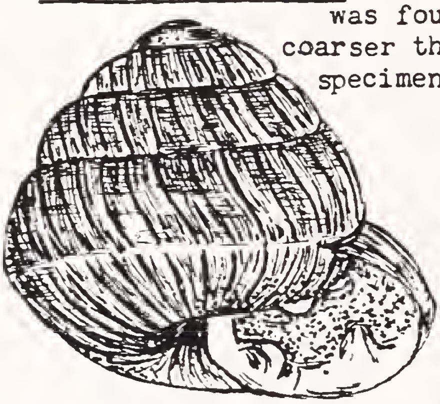
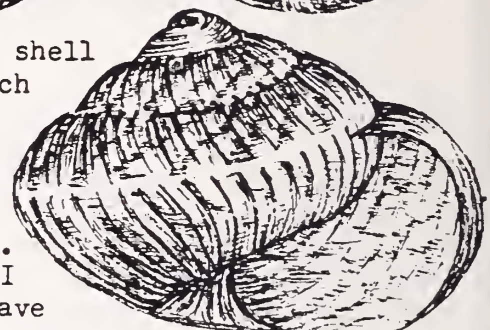
←3.3 x 2.4 mm.



Delos coresia (Gray). This species was reasonably common but at site 17 two specimens were found which I have drawn here. They were larger than ordinary coresia and did not have the flared body whorl, nor did they compare with jeffreysiana as they were much flatter across the top.
4.5 x 2.0 mm. Site 17.


Phenacohelix pilula (Reeve). Only this one juvenile shell was found with coarse ribbing, much coarser than any of the sandhill specimens at Port Jackson.
2.4 x 1.7 mm site 18.

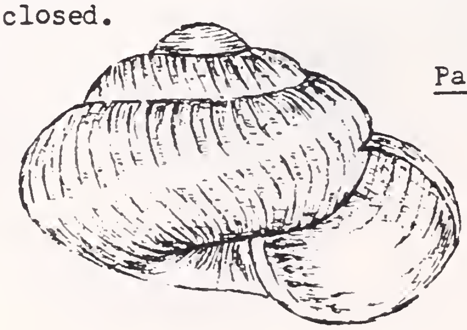



Laoma pirongiaensis(Suter). Though I did not find many others have reported it to be quite common .
2.1 x 1.7 mm. site 5.

Phrixgnathus alfredi (Suter). I had a lot of trouble identifying this shell in the first place as the first ones I found - illustrated on the right- were somewhat flatter than subsequent specimens. With their plain white colouration they gave the appearance of an introduced species. 1.8 x 1.0 mm. site 1.
Later specimens were more dome shaped and inclined to be yellowish . It was found at a total of eight sites.
2.0 x 1.4 mm site 9.

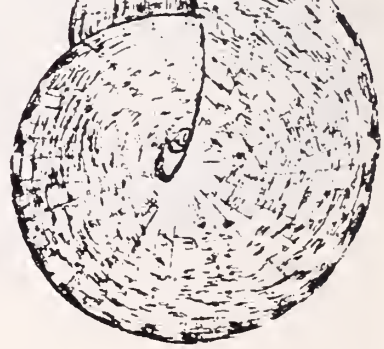



Phrixgnathus cheesmani (Suter). Whereas in the Coromandel Ranges the umbilicus was narrowly open, here the four specimens I saw all had it completely closed.
4mm. site 6.

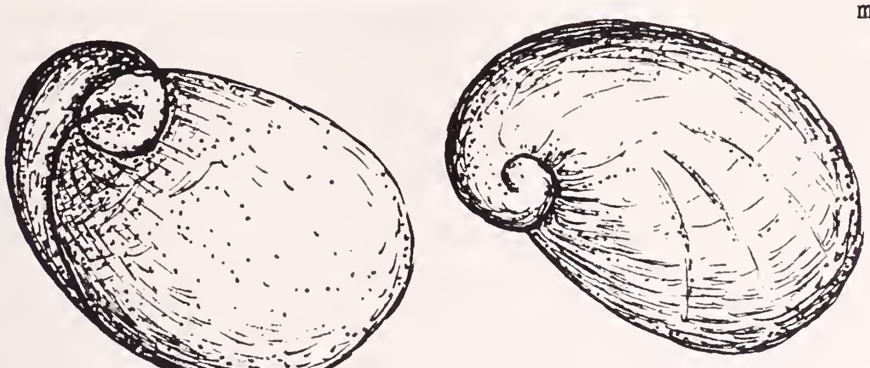


Paralaoma N.sp. 8. The small paralaoma species were largely missing on this survey

1.0mm x 0.8 mm
site 7.



Schizoglossa novoseelandica barrierensis (Powell). Not so elongate as the mainland species. Members of this genus are nowhere common and it is pleasing to see them so numerous here.



12 x 10 mm. site 2.

Discussion

I have not been able to find many records of past collecting on the Island. Milligan (Tane Vol. 7 1955-56) mentions collecting 25 sps. under Mt. Hobson but only reveals a few. N. Gardner gives a list of small land snails from leaf mould taken at Oruawharoa, Gt. Barrier Is. - 1966 (Poirieria Vol. 3 Pt. 6). I reproduce that list here for it contains some species which I did not find.

Liarea egea (Gray)
Allodiscus planulatus (Hutton) *
Therasiella celinde (Gray)
Charopa coma (Gray)
Charopa ochra (Webster) *
Fectola buccinella (Reeve)
Laoma marina (Hutton)
Laoma leimonias (Gray)
Phrixgnathus erigone (Gray).
Phrixgnathus ariel (Hutton) *
Delos coresia (Gray)
Cytora torquilla (Suter)
Therasiella tamora (Hutton)
Suteria ide (Gray)
Flammulina costulata (Hutton) *
Ptychodon pseudoleioda (Suter)
Ptychodon hunuaensis (Suter)
Subfectola caputspinulae (Reeve)
Geminoropa subantialba (Suter)
Phrixgnathus cheesmani (Suter)
Tornatellinops novoseelandica (Pfr.)

* These are the species I did not find, indeed I have not found costulata anywhere on the Peninsular myself.

Phrixgnathus alfredi, Charopa transenna and live Phenacohelix pilula do not appear to have been found on the Coromandel Peninsular to date but it is perhaps premature to list species missing on the Gt. Barrier and found further south. It was surprising not to find Rhytida greenwoodi which is so prevalent at Port Jackson.

The Great Barrier Is. seems not to have been isolated long enough to have developed its own endemic species but would probably have acquired its fauna when joined to the Coromandel Peninsular. However, some species have arrived from the west and south - west by some other route, but they may be accidental introductions. Some modification , though, has appeared in Schizoglossa and other species may show a similar change when they are studied in more detail.

Acknowledgement

Dr. F.M.Climo kindly identified Phrixgnathus alfredi .

Previous Reports

Landsnails from the Hunua Range - 1977.
Landsnails from the Coromandel Peninsular -1979.
Native Landsnails in the Moehau Block -1980.

J.F.Goulstone
93 Hall Av.
Mangere,
Auckland.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	2	2
Tornatellinops novozelandiae	1	1								1											1
Schizoglossa novoseelandica barrierensis		1									4										
Delos coresia	2	5	2			1				2	2					4	2		1		
Liarea egea	13		16	2	11	4	1		2	3	2			3		9			9		
Cytora cytora	1	1	3	1	1	3		1	3	1				1		1	1				
" torquilla						2															
Omphalorissa purchasi					1											1					
Charopa anguicula								1													
" coma									1		1		1								
" chrysaugeia							1														
" pilsbryi		1																			
" n.sp.						1															
" transenna													1								
" buccinella			1		1	4			2						1	1		1			
Subfectola caputspinulae	4	4			1							1									
Mocella 1		2							2	2		1				2					1
" 3	1										3							1			
Geminoropa microrhina		1																			
Mocella accelerata	2																				
Mylesia hectori		1				1									1						
" pseudoleioda		2								1											2
Fectola infecta				1							1		2								
Suteria ide	4	4		3		2	1		2	2	2						2				
Therasiella celinde							1		1								2				
" tamora	1		2	1		1	1		1				2		1	1					
" neozelanica	4		1	2	2	3	1	2	1		1			1		1			6	2	
" serrata		2					1														
Flammulina perdita	2	4		1							1		1								
" cornea				1																	
Therasia decidua	2			1									3							1	
Serpho kivi		1			1				2				1		1						
Allodiscus dimorphus													1								
" granum						2	1														
" mossi																	2				
" urquharti	4					3	1									2					1
Phenacohelix ponsonbyi				6	1	1	1		2		17	1	9								
" pilula																		1			
Laoma marina					5		8			4	2				2	5					
" poecilostica					1			1					1				5				
" pirongiaensis					1									1							
" leimonias		2	2			2									8	1			1		
Phrixgnathus erigone					2	4			1				1								
" cheesmani						2		1		1											
" glabriusculus	5	3		7					1		6		3			1					
" alfredi	3				2			1	3					1	2			4	2		
" conella																					
" fulguratus	2																	2			
Paralaoma N.sp. 3.			1					1													
" n.sp. 8.							1														
" n.sp. 12.	1														2						
" n.sp. 17.	3	1	2		1										2		1	4	1		
" n.sp. 29.	2	1	2				3			2											
" n.sp. 55.			3																		
" gracilis *							1														

* N.sp. 33. in the Coromandel report and Paralaoma n.sp. in the Hunua report. As F.M.Climos work on this group continues numbers are disappearing and joining and being replaced with names. It will save confusion to use the name where it appears to be settled.

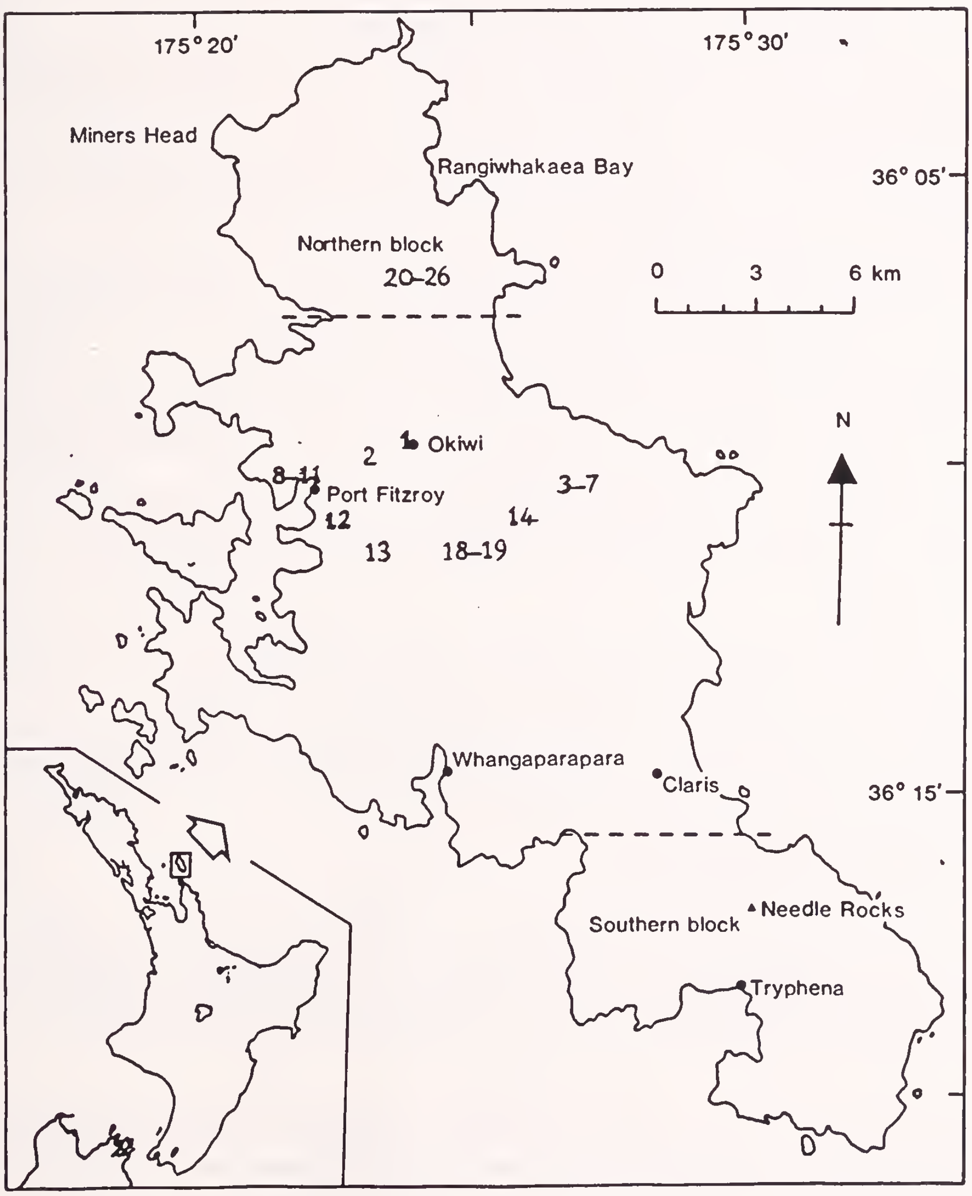
GREAT BARRIER ISLAND LANDSNAILS March 1990, J. F. Goulstone.

This survey was the result of my collecting over one week while I was with an Auckland Museum Conchology Section field trip staying at the D.O.C. house at Fitzroy. It is an addition to my 1981 survey and covers an area immediately to the north of that one with some overlap. I managed to penetrate some distance into the Northern Block where the bush type is so different from the rest of the island and noticed that small snails were particularly abundant. On the other hand the summit of Hirakimata which promised so much produced very little. In this respect it reminded me a lot of Moehau on the Coromandel Peninsular just to the south.

The earlier report was done as part of a larger Coromandel work but the Great Barrier snails contain ingredients of a more northern fauna as well so other links have been present in the past. I have based this survey on my South Auckland Report (Poirieria vol. 16 no. 2 Dec. 1990) which is more up to date, and have only illustrated here those species either not present or rather different from the South Auckland ones. I have of course looked again at all those snails I collected in 1981 and have made a few changes and additions; **N. sp. 3** & **N.sp 1** are the same (**Punctid**). **Paralaoma gracilis** was in fact **Punctid N.sp. 32. Allodiscus mossi** was wrong also and I have re-drawn it here for I found a better specimen on this trip. It seems to be something peculiar to Great Barrier and I am now calling it **Phenacohelix cf pilula (a).** The **Charopa n. sp.** I am happy to report is now **Paracharopa goulstonei** (Climo), but I didn't find anymore this time. Lastly, the large **Delos coresia** which I drew in 1981 was only the local form of **Delos jeffreysiana** for I found more on this trip.

Phrixgnathus alfredi has turned up again at many sites and in good numbers and could probably be called a Gt. Barrier endemic as it now seems to have disappeared from the mainland. **Phrixgnathus cheesemani** is probably at its southern limit as all my Coromandel sitings have turned out to be very old **Phrixgnathus fulguratus,** as was the specimen I drew in the Waitakere Report (Poirieria Vol 13 no. 1, 1983).

Table of Sites.



1.Okiwi Swamp. This was an area just off the road, alongside a stream, between the school and the airstrip probably extending right down to the harbour. It was full of Rush and Cabbage Tree, very wet and impenetrabl in places. Collecting had to be done on the spot as there was no loose material to take away and though I only found two live specimens in half an hour,I was only on the very edge and formed a distinct impression that the swamp could be harbouring a large number of small snails.
2.Okiwi- Fitzroy. On the side of the road near the top of the hill on the eastern slope but down a very steep gully. I took away 2 litres of litter from under very large Taraires.
3.Harataonga Scenic Reserve. This lot was collected on the spot from Nikau fronds, under Puriri, Taraire, Tawa and Mahoe to name just a few of the prominent trees. Though I haven't recorded them I noticed a few old **Rhytida** shells here, very worn but large. The D.O.C. rangers always mentioned **Rhytida** when I asked them about **Paryphanta**, but in my own collecting I hardly saw any. Around Port Jackson at the northern tip of the Coromandel Peninsular they are abundant.
4-7 Harataonga Scenic Reserve. These were 2 litre lots taken from a variety of sites, though all within a hundred metre radius and in the same area as the previous live collecting.
8-9. Old Lady Walk, Fitzroy. A lovely walk following a small stream with a lot of tall Taraire and some old Puriri. I took two 2 lt. samples from under two large Puriris.
10. Across the Port Fitzroy harbour some lovely big trees grace the hill and descend to overhang the water. Sadly this bush which looks so beautiful from afar, has been devestated underneath by animals. I found 2 lts of litter which still contained snails but this piece of bush can only be termed cosmetic.
11. I went over the hill from this last site through some very thick Titree and gorse, and took 2 further litres of litter from some better looking second growth coastal bush. A lovely deserted sandy beach was way down on my right but access looked impossible because of the thick scrub.
12. The waterfall on the stream behind the D.O.C. office. The bush was all second growth but the trees just alongside looked untouched and I collected 2 lts. of litter on a very steep face.
13.Kiarara Nikau. Some on the spot collecting in fronds alongside the river.
14. Windy Canyon, amongst rocks, I collected 2 lts. of fine litter. One day while passing the school at Okiwi I stopped for a drink of water. Some parents were helping their children plant some seed in the flower garden and one of the mothers told me she had found a **Paryphanta** shell at Windy Canyon, though in the scrub between the road and the cliffs. I wasn't able to find anyone who had a shell still in their possession but was always being told of someone else who had one. Wild pigs are very prevalent and it would be a miracle if any **Paryphantas** survived. I am not sure wether these snails are , or have been natural inhabitants of the Island or were introduced by man.
15. Hirakimata. Collected by eye under an old Rimu in virgin bush on the eastern approach.
16.2 lts. of litter under another Rimu in the same area. Though old these Rimus were rather stunted, I suppose by the severe weather near the summit.
17. 2 lts. from several locations along a flattish ridge just before the last sharp ascent to the summit.
18. 2 lts. from yet another Rimu alongside the previous ones. I have a weakness for Rimu for they certainly can produce a litter around their base much favoured by small snails.
19. 2 lts. from underneath some coarse thick cutty grass on the eastern summit ridge.Snails were not plentiful around the summit and the reason is not immediately apparent for conditions seem ideal. On Moehau I was fairly certain the little frogs were eating them so perhaps they have another predator here. Other known predators include certain ants and a small brown skink.
20. Northern Block.I walked the track from the Whangapoua Rd. north to the top of the first hill and a littl down the other side. The rangers told me later that this in fact covered the best part of the bush and it degenerated to scrub after this until well on to Tataweka. This lot was just line of site collecting into a tube as I went along.
21.Under a very large Totara near the summit and then under a large epiphyte which had fallen off and was rotting on the ground. I took another 2 lts. which is my standard sample.
22.2 lts..at the start of the track, quite close to the road, under a Puriri.
23. 2 lts. from another Puriri, but this time at the furtherest point I reached, over the summit and in a hollow close to an enormous pig wallow, Indeed pigs were everywhere and one followed me up the track for quite a distance until I got a bit uneasy and chased it off the side.
24. Near the summit under a large Rimu, 2 lts.
25. 2 lts. near the summit under Tree Fern.
26. 2 lts from under a large Kata close to a stream on the track near the road.

Acknowledgements. I found the staff of the Department of Conservation at Port Fitzroy very helpful and very interested in everything pertaining to the Island.
Bruce Hazelwood is an ever present force in all my snail work now, for I know that if I get it wrong Bruce will notice.

Table of Species.

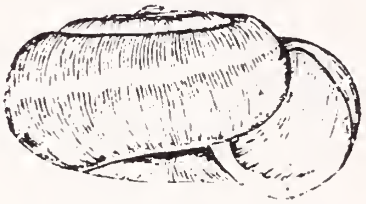
There are two more changes to the original 1981 list I should have mentioned:- **Charopa anguicula** is now **Phenacharopa pseudanguicula** and **Geminoropa microrhina** should be **Geminoropa cf cookiana.**

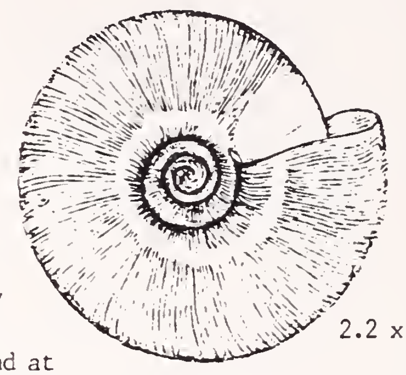
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Tornatellinops novoseelandica		1						5	1	5												5	3		3	
Schizoglossa novoseelandica barrierensis			2		1				1																	
Delos coresia			2		1	3	3	8	2	13				2						1			1		2	
Delos jeffreysiana									1			2			1		1					1		2		
Liarea egea		5	16	19	8	4	8	16	35	6	16	13				1				14		10	3		2	3
Cytora cytora		2	1	1	3	7	2		6					2	1			5								
Cytora torquilla				2		1	1																1			
Omphalorissa purchasi														4												
Phenacharopa cf pseudanguicula						1																				
Charopa coma			5						2	6	1	1	1							3		2	2		3	
Charopa pilsbryi									1															1		
Paracharopa chrysaugeia						1				1															1	
Flammocharopa sp. c																			2		2	1				
Rhytida greenwoodi						1																				
Pseudegestula transenna																										
Cavellia buccinella			3	2	7	5		2	5	5	2		1	1								10	4			1
Cavellia reeftonensis				1											2							2	1			1
Mocella eta					3			1	2	4				1						2		1	3		I	
"Mocella" 1			1			5																				
'Mocella' 3			2		1	3			3		3											7				
Geminoropa cf cookiana																										
'Mocella' 9												1														
Huonodon hectori									1	2											1	3				1
Huonodon pseudoleioda																			1							3
Fectola infecta				1		1						1	3							1					1	
Fectola unidentata		2										1														
Suteria ide	1		10		1	4					11	2		3	5		1	1								
Therasiella celinde					1	4	1	8	6	1		2				1			1		14	1		12		
Therasiella tamora			1						1																	
Therasiella neozelanica					2	1			2	1		3														1
Therasiella cf neozelanica		1		2	1	1		8	6	1					1			1			2			1	3	
Therasiella serrata					1			6																		
Flammulina perdita			1	3		3			1	3	1	2								4	2				2	
Flammulina cornea																				2						
Therasia decidua		1	4	1	2	7		1		8	4	4								13		10	4		11	1
Serpho kivi			3			1						2		1							1			1		
Allodiscus dimorphus																				2						
Allodiscus planulatus					1																					1
Allodiscus urquharti							2	13	1					1												
Phenacohelix giveni			3	1		1			1	1		5	3							4		4			1	
Flammulina feredayi																1			1							
Phenacohelix cf pilula (a)						1																				
Laoma marina		1	4	1	3		9	9	8	3	4	4														
Laoma cf marina (b)							5															1				
Laoma poecilosticta																										
Laoma pirongiaensis				1																						5
Laoma leimonias		1			6				5					2	2								11			1
Phrixgnathus erigone		2		3	2	2						2							3							
Phrixgnathus cheesemani				3	1	5																				
Phrixgnathus ariel																				5		1	3		4	
Phrixgnathus cf lucidus (a)																					2	1		1		
Phrixgnathus glabriusculus			4																	1		4				
Phrixgnathus cf glabriusculus				2		1		1	5	1		2	4							11	1	7	11	7	9	
Phrixgnathus alfredi						8		9	1			6		2							18			19	1	4
Phrixgnathus conella	1		1	1		1			1							1								1		
Phrixgnathus cf conella													1							1						
Phrixgnathus fulguratus																	1									
Phrixgnathus serratocostatus					1																		1	1		
Punctid n. sp. 1																								7		
Punctid n. sp. 7						1																1				
Punctid n. sp. 8		2						3																5		
Obanella rimutaka						4												1								
Punctid n. sp. 17				6	1	5		1	3			1									2		1	5		
Punctid n. sp. 29				3	4	5	6	9	7	14											6	8	6	15	7	2

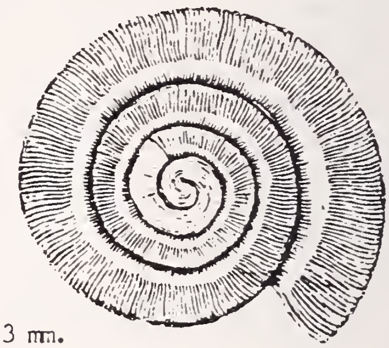
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Punctid n. sp. 32						1				2											1					
Punctid n. sp. 40															1											
Punctid n. sp. 55				1																5	28		3	12	40	13
Punctid n. sp.																			1							
Paralaoma lateumbilicata				2	1					13												7	2			
Paralaoma miserabilis				1																						
Oxychilus sp.											3															
Cochlicopa lubrica											1															

These last two are introduced species and although I didn't collect any, **Helix aspersa** will be there as well

Illustrations of Species.

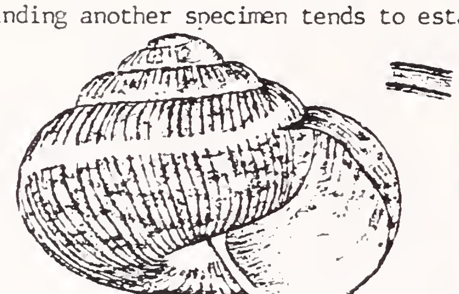


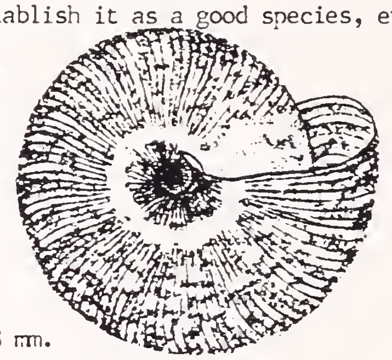




" Mocella " 9 This is a white very finely ribbed specimen which I only found at one spot. It is the exact replica of only one specimen I found at Huia, Waitakere, which is the one I have shown here. It has 8 or 9 spirals on the protoconch which distinguish it from **'Mocella" prestoni** (Sykes) which only has 4. I have thought it was just an oddity but finding another specimen tends to establish it as a good species, even if very scarce.

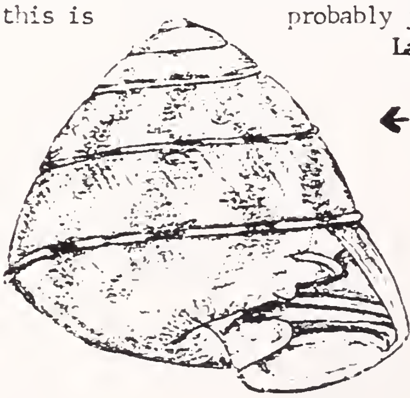
2.2 x 1.3 mm.





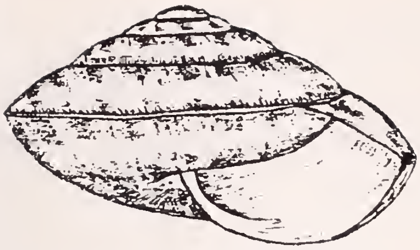
Phenacohelix cf pilula (a). 3.5 x 2.8 mm.

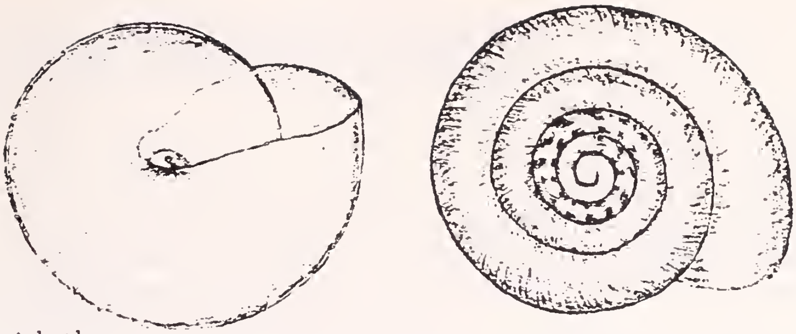
This shell has the marbled colour pattern of an **Allodiscus** but its shape is **Phenacohelix.** The microscopic spiral sculpture is very strong over the whole shell showing up between the ribs. There are quite a few variations of **pilula** throughout the country and this is probably just one more.



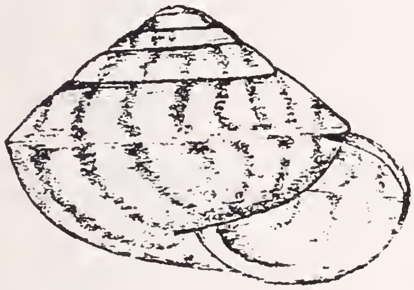
Laoma cf marina (b). 2.3 x 1.9 mm. This is quite a distinctive little snail obviously derived from **marina** but living with it here on the Gt. Barrier. I believe it is not endemic but occurs also around Warkworth (B. Hazelwood pers. comm.). If so it is one of those links with the North.

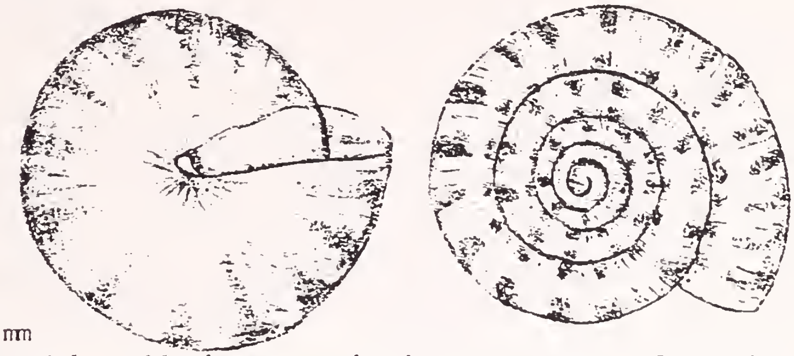
Phrixgnathus cf conella 3.4 x 2.5 mm This I think is also on the Little Barrier but I dont think it has been found anywhere else. It wasn't common in my collecting but the shell was easily recognised from **conella** by a rather distinctive colour pattern.



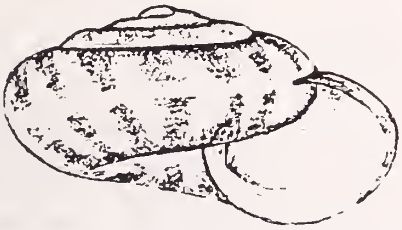


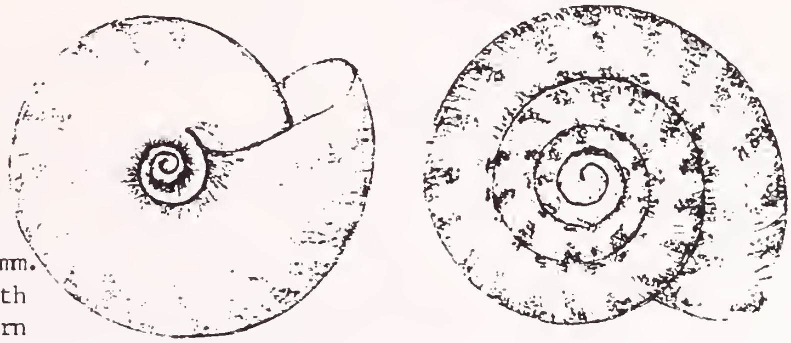
Phrixgnathus cheesemani (Suter).
4.5 x 2.8 mm. This is another link with the North as it does not occur further south. It seems to be a variable species in the north and I have always had trouble with it as indeed Suter had.



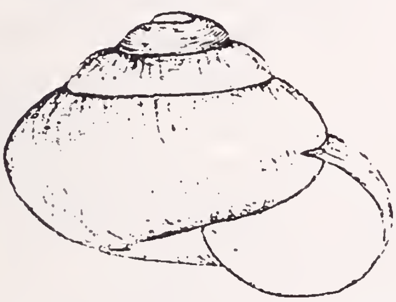


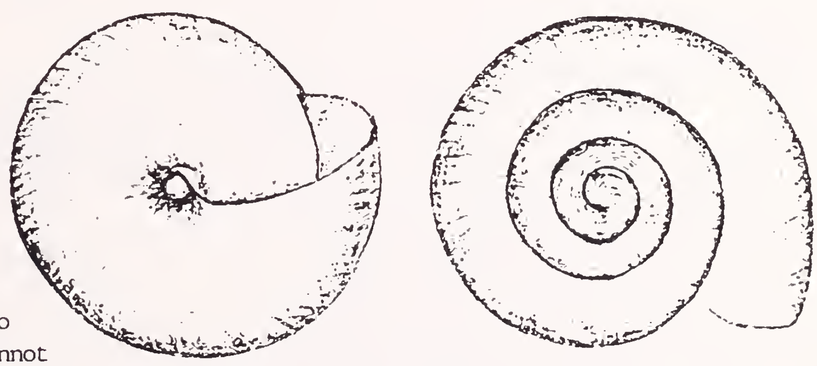
Phrixgnathus cf lucidus (a) 2.9 x 1.8 mm
This represents another variation of a mainly Auckland species, though it is present at Coromandel. It is different looking from **cf lucidus** but I didn't find many and only then in the Northern Block. They are attractively marked shells.





Phrixgnathus cf glabriusculus 2.8 x 1.7 mm.
These snails were very common in the north of Great Barrier particularly the Northern Block. They don't look much like the mainland specimens but seem to represent something between **cf glabriusculus** and **moellendorffi.**





Punctid n. sp. 1.2 x 0.8 mm. I found two of these specimens on Hirakimata but cannot place them. Such tiny indiscriminate shells are quite common in New Zealand and always hard to identify.

Remarks

Even if there doesn't turn out to be any true endemics several species are turning up with marked variations from their mainland brothers (or sisters). Great Barrier is large enough to sustain a good total of species, indeed perhaps as many as two thirds of the Auckland species.

THE STATUS OF SOME CHAROPID GENERA
(Mollusca : Pulmonata : Charopidae)

Bruce Hazelwood
Flat 7/46 Amy Street
Ellerslie, Auckland.

Fectola Iredale 1915
Mocella Iredale 1915
Cavellia Iredale 1915
Charopa (Geminoropa) Iredale 1933
Fectola (subfectola) Powell 1939
Geminoropa (Cavellioropa) Dell 1952

INTRODUCTION

The reason for this paper has been brought about by the confusion that reigns within these genera. The treatment of **Mocella** Iredale 1915 and **Fectola** Ireland 1915 by Climo 1978 & 1981 does not follow the intentions of Iredale. This is clearly stated by Climo 1981. The type specimens have been misidentified, genera erected on the fore-mentioned misidentifications and alterations made to groupings attributed to each genus.

My intention is to show what has happened as to the usage of **Mocella** & **Fectola** and other associated genera, following the treatment of each genus by recent authors.

Subfectola Powell 1939, according to Climo 1981, belongs in synonomy of **Paralaoma** Iredale 1913, again due to misidentification of the type specimen. **Helix caput-spinulae** Reeve 1852 type, was attributed to the wrong group of snails.

The status of **Geminoropa** Iredale 1937 and **Cavellia** Iredale is discussed.
I (Hazelwood), have included Suters descriptions to Iredale text.

THE STATUS OF SOME CHAROPID GENERA

In following the course of events by different authors it is essential that we understand the interaction between two papers. They must be read together!.
Manual of the New Zealand Mollusca H. Suter 1913.
A Commentary on Suters Manual of the New Zealand Mollusca T. Iredale 1915.
Following is the text in full, relating to these genera by Iredale 1915 pages 479–480.
Genus **Endodonta** (Albers 1850) p684.

I, (Iredale), have proposed the rejection of this generic name from the **Neozelanic** fauna, and this course will sooner or later be adopted as the worker responsible for its introduction into that fauna, has regretted his action and latterly repudiated it. Suter has classed thirty-seven species, four subspecies, five varieties and seven formae under this genus name.Five subgenera are recognised, and it would have been easy, simply to write that these should be recognised as genera; but unfortunately the first two subgenera used by Suter cannot be differentiated by the descriptions he has given, which are copied from Pilsbry's Guide to the Helices (Man.Conc.2ndser.Vol.1X 1893). In my paper quoted above (Iredale), the only one I have yet written dealing with Australasian land molluscs, I suggest their identity. I there stated however, that later, many genera might be recognised when the animals were carefully studied in conjunction with their shells. In the meantime I (Iredale), would suppress **Thaumatodon** and simply generically use **Ptychodon.** The recognition of **Phenacharopa** as a distinct genus cannot be denied, whilst **Aeschrodomus** claims generic rank.

Charopa however, covers many generic types, and it is pleasing to read (p700) Suters memo- "In my opinion, only very few of the Tasmanian & Australian species assigned to **Charopa** really belong to it". As I (Iredale) had written, it appears doubtful whether typical **Charopa** has yet been recorded from Australia.. In this subgenus (**Charopa)** Suter distinguishes five groups, and here again he has utilized the protoconch features to a large extent, exactly as I (Iredale) had done, though my work was quite independently performed. In as much as the coincidence is fairly exact, and I was working upon Australian material, kindly loaned me by Mr.J.H.Ponsonby, whose collection of these shells is very complete, and also extra-limital Pacific shells, while Suter was criticizing **Neozelanic** shells, the groupings may be considered quite natural and I here propose some of the generic names I had conferred in my manuscript dealing with Australian shells. Many others will later be proposed by other workers as well as myself.

I (Iredale) introduce -

Egestula gen nov	Type **Helix egesta** Gray 1850
Fectola gen nov	Type **Helix infecta** Reeve 1852
Mocella gen nov	Type **Helix corniculum** Reeve 1852
Cavellia gen nov	Type **Helix biconcava** Pfeiffer 1853

The genus **Ptychodon** as here after admitted as polyphyletic, but none of the species assigned to **Thaumatodon** by Suter agree at all with the type he has named.

My (Iredale) nomination of the genus **Endodonta** of Suter would then read -
Genus **Ptychodon** Ancey 188

Ptychodon cryptobidens (Suter 1891)
jessica (Hutton 1883) **Thaumatodon** (Sensu Suter)
monoplex (Suter 1913)
tau (Pfeiffer 1862) **Thaumatodon** (Sensu Suter)
varicosa (Pfeiffer 1853) **Thaumatodon** (Sensu Suter)
iredalia (Webster 1908) **Thaumatodon** (Sensu Suter)
aorangi (Suter 1890)
chiltoni (Suter 1909)
hectori (Suter 1890)
hunuaensis (Suter 1894)
leiodus (Hutton) 1883
microundulata (Suter 1890)
minuta (Suter 1909)
pseudoleioda (Suter 1890)
uraweraensis (Suter 1899)
wairarapa (Suter 1890)

Genus **Phenacharopa** Pilsbry 1893
Phenacharopa novoseelandica (Pfieffer 1853)

Genus **Aeschrodomus** Pilsbry 1892
Aeschrodomus barbatulus (Reeve 1852)
stipulatus (Reeve 1852)

Genus **Charopa** Albers 1860 (Type coma) (Suters group 1)
Charopa anguicula (Reeve 1852)
montivaga (Suter 1894)
benhami (Suter 1909)
bianca (Hutton 1883)
chrysaugeia (Webster 1904)
coma (Gray 1843)
ochra (Webster 1904)
pseudocoma (Suter 1894)
titirangiensis (Suter 1896)

Suters Manual E (**charopa**) (Group 1)

Shell having smooth protoconch. Riblets more or less arcuate, retractive; interstices without or with microscopic spiral lines, often indistinct; umbilicus wide.

Genus **Egestula** Iredale 1915 (Type **egesta**) (Suters group 2)
Egestula egesta (Gray 1850)
gaza (Suter 1909)
transenna (Suter 1904)

Suters Manual E (**charopa**) (Group 2)

Shell with radial riblets and very distinct spiral lirae. Protoconch smooth or spirally lirate.

Genus **Fectola** Iredale 1915 (Type **infecta**) (Suters Group 3)
Fectola alpestris (Suter 1891)
buccinella (Reeve 1853)
caputspinulae (Reeve 1852)
eremita (Suter 1891)
irregularis (Suter 1890)
otagoensis (Suter1899)
roseveari (Suter 1896)
subinfecta (Suter 1899)
variecostata (Suter 1890)
Fectola browni (Suter 1891)
serpentinula (Suter 1891)
colensoi (Suter 1890)
infecta (Reeve 1852)
mutabilis (Suter 1891)
reeftonensis (Suter 1892)
sterkiana (Suter 1891)
tapirina (Hutton 1883)

Suters manual E (**Charopa**) (Group 3)

Shell with radial riblets, protractive above the periphery and retractive towards the suture. Spire flatish; umbilicus wide, perspective. Peristome retracting at the suture , forming a distinct sinus, advancing above and at the periphery. Protoconch radially striate; sometimes smooth in **E tapirina** and **subinfecta**.

Genus **Mocella** Iredale 1915 (type **Corniculum**) Suters Group 4

Mocella alloia (Webster 1904)
kenepuruensis (Suter 1909)
segregata (Suter 1894)

Mocella corniculum (Reeve 1852)
prestoni (Sykes 1895)

Suters Manual E (**charopa**) (Group 4)

Shell having nearly straight radial riblets; peristome straight; umbilicus moderately wide, more or less conical. Protoconch spirally striate.

Genus **Cavellia** Iredale 1915 (type **biconcavá**) Suters Group 5.

Cavellia biconcava (Pfeiffer 1853)
moussoni (Suter 1890)
vortex (Murdoch 1897)

Cavellia huttoni (Suter 1890)
subantialba (Suter 1890)
microrhina (Suter 1909)

Suters Manual E (**charopa**) (Group 5)

Shell discoidal, spire concave or infundibular. Protoconch radially striate smooth or spirally lirate.

These types in the British Museum were named by two authors, using the same type specimens.

Reeve 1852	Pfeiffer 1853
Helix stipulata	**Helix alpha**
Helix barbatula	**Helix beta**
Helix corniculum	**Helix eta**
Helix buccinella	**Helix gamma**
Helix infecta	**Helix zeta**
Helix caputspinulae ?	**Helix epsilon ?**

infecta
Conch Icon V11, pl132 f808

stipulata
Conch Icon V11, pl 132 f813

barbatula
Conch Icon V11, pl 132 f 814

corniculum
Conch Icon V11, pl 133 f 826

buccinella
Conch Icon V11, pl 133 f 821

caputspinulae ?
conch Icon V11, pl 133 f 818

zeta
Monog Heliceorum Viventium 111, p 109

alpha
M.H. Viv. 111 p 112

beta
M.H. Viv. 111, p 112

eta
M.H. Viv. 111 p 107

gamma
M.H. Viv. 111, pl 100

epsilon?
M.H. Viv. 111, p 97

Note 1 -
Who was the author - paper for above synonomies?

Note 2 -
Are these all the species involved?

Classification of N.Z. Arionacea (Mollusca Pulmonata V1)
A Review of the N.Z. Charopine Snails with Lamellate Apertures,
Nat. Mus. N.Z. Vol 1, no 12, pages 177-201 May 5th 1978, F.M. Climo.

In this paper, Climo redefines the Genus **Fectola** Iredale 1915, type species **Helix infecta** Reeve 1852. Due to misidentification **Helix infecta** was attributed to the wrong group of snails. This anomaly was noted by Dr. Solem. Also no holotype had been selected. He then selected a lectotype from the co-type material.

Fectola infecta synonomy

Helix infecta Reeve 1852
Helix zeta Pfeiffer 1853
Helix tau Pfeiffer 1862

In the above paper, Climo states,
'**Helix infecta** is however synonomous with **Helix tau** Pfeiffer 1862 based on same type specimen".
This is incorrect!.

Helix infecta Reeve 1852 = **Helix zeta** Pfeiffer 1853.
Same type specimen. How were the specimens labelled? Is **Helix tau** synonomous with **Helix infecta?.**
Helix tau Pfeiffer 1862. Type specimen Pommersches Museum, Stettin.
Synonomy follows Dell (unpublished notes) Climo Pers com.
Reference to Dell Climo 1969 page 203, Holotype of **Varicosa** (illustration).
Patula timandra Hutton 1883 type Canterbury Mus.is omitted from the synonomy lists Climo 1978.

Climos redefined **Fectola** formerly held with **Ptychodon** applies to the **varicosa** group of snails, previously assigned to **Thaumatodon** by Suter - (Webster).

Fectola – varicosa, mira, infecta, jessica, jamiesoni, charopiformis, unidentata, trilamellata & **paytoni.** Full data at back of paper. Climos redefined **Fectola**, lists a different group of snails to Iredale 1915. Iredale placed this assemblage within **Ptychodon**, suppressing **Thaumatodon. Ptychodon** he stated is polyphyletic. This clearly states the intentions of Iredale.

Using the misidentified type specimen, Iredale erected **Fectola** on the basis of Suters 1913 identification, description–group diagnosis E (**Charopa**) (group 3).

When naming **Fectola–Cavellia** he in fact named the flat, raised–sunken members of the same genus. Iredale did not describe the genera in his paper, relying on Suters diagnosis in Suters Manual 1913

1. Iredale 1915 **Fectola** has page–place priority over **Cavellia.**
2. Climo 1969 lists **Cavellia–Fectola** in synonymy of **Ptychodon.**
3. Climo 1969 synonymises **biconcava** with **Infecta.**
4. Powell 1979 Treatment of **Fectola–Mocella** follow exactly that of Climo 1969.
5. Climo 1981 Reinstates **Cavellia** for **Fectola** Iredale 1915 (non Climo 1978) in discussion (Climo 1981 page 12).
6. **Helix biconcava** Pfeiffer 1853 has to come out of synonymy as the only name available for **"infecta"** of Suter.
7. **Fectola infecta** (non Reeve) Suter 1913 however is a distinct species from **biconcava,** both living sympatrically in a few lower North Island localities. Both are clearly good species. (Climo pers com).

Cavellia NSP

Form A Hawkes Bay – Wairarapa, North Island (limestone in general).

Form B Puponga – Takaka, South Island (limestone in general).

Form B is thought to be a related New Species.

There is a discrepancy in the radula formula for **Cavellia NSP.**

Climos formula includes Form B – **biconcava.**

Climo – 5 – 8 + 4 – 5 + 1 + 4 –5 + 5 – 8

Suter 12 + 3 + 1 + 3 + 12

Subsequent workers have followed Iredales intentions regarding **Fectola, Mocella** & **Cavellia until** Climo 1978.

The species of **Cavellia** Iredale 1915 listed by Suter and Iredale, apart from the type species, **biconcava,** have been transferred to **Geminoropa** Iredale 1933, Dell 1952.

Cavellia biconcava has to be brought out of synonymy.

Geminoropa **cookiana** Dell 1952.
huttoni Suter 1890.
microrhina Suter 1909.
moussoni Suter 1890.
subantialba Suter 1909.
vortex Murdoch 1897.

Dell 1952 introduced **Geminoropa** for **vortex.** This was based on specimens of **Geminoropa antialba** in the Suter Collection, which display spirally lined protoconch. In this same paper Dell proposed subgenus (**Cavellioropa**) for the remaining species.

Climo 1970 – Powell 1979 Generic placement which still stands today, **Charopa** (**Geminoropa**) for all species **Cavellioropa** in synonymy.

Geminoropa antialba is an Australian species.

It has been related to me, Climo pers com, that the New Zealand members of **Geminoropa** Iredale 1933, do not belong to that genus. **Cavellioropa** Dell 1952 would then become available for those species with "smooth" protoconch, listed by Dell 1952.

Endodonta (**Charopa**) **vortex** Murdoch 1897 and relatives, all new, require a new genus. These new species, Akatarawa Hill, Tararua Ranges; cave entrance deposits, South Island, Roscoe; Stewart Island, Hazelwood; are more closely related to one another, than to the other sunken spired charopids.

There is considerable debate regarding the Families involved here. Climo has followed Solem, using **Punctidae Charopidae Endodontidae Flammulinidae & Rotadiscidae,** although he has placed **Rotadiscus** in **Rotadiscinae** as a sub family of **Charopidae.**Climo 1989. Burch 1976 lists **Geminoropa** as a member of the **Punctidae,** subfamily **Endodontinae** Pilsbry 1895.To follow Solem – would read **Endodontidae** N.Z. species belong to the **Charopidae.**

Endodontidae Flammulinidae & Rotadiscidae may only be sub families of **Charopidae.**

Climos treatment of **Mocella** Iredale1915 shadows that of **Fectola Mocella** Iredale 1915.

Type species **Helix corniculum** Reeve 1852 (preoccupied).

Type species **Helix eta** Pfeiffer 1853.

Both names are based on the same type specimen.

Due to misidentification, shown Climo 1981, the type specimen **Helix eta** Pfeiffer 1853, was found to be synonymous with **Helix caputspinulae** Reeve 1852,(Sensu Suter Iredale Powell - Climo). In this same paper it was shown that the type specimen of **Caputspinulae** has been misidentified in the past. Climo transferred **Mocella** Iredale 1915 to match its type species **Mocella eta** = **Subfectola caputspinulae** (Non Reeve) Powell 1939. The identity of **helix caputspinulae** Reeve 1852, British Museum, was found to be synonymous with the type species of **Paralaoma** Iredale 1913, a member of the **Punctidae.**
Helix caputspinulae Reeve 1852 = **Paralaoma raoulensis** Iredale 1913
= **Paralaoma pumila** Hutton 1883 (unpublished information).

The type designation for **Paralaoma - raoulensis** was extracted from Journ.Mal.Soc.Aust Vol 3, N3-4 page 133 J.B.Burch 1976. **Subfectola** is sunk in synonymy of **Paralaoma** by type association.

Mocella Iredale 1915 (Non Climo 1981) = New Genus (unpublished). **Patula corniculum** (var **Maculata**) Suter 1890 has to come out of synonymy, as the first available name for **Mocella eta** (non Pfeiffer).

Examination of **Helix epsilon** Pfeiffer 1853 is required as it has page priority over **Helix eta** Pfeiffer 1853. At present **epsilon** is in synonymy of **Helix caputspinulae** (non Reeve) Powell. Type specimen is in the British Museum.

Is **epsilon** a synonym of **caputspinulae** or **eta?.**

Did **epsilon - caputspinulae** share the same type specimen?.

The reason for this paper is to show what has happened regarding the name fixing for all these genera, with the family **Charopidae.** New genera are required where indicated, new genera A, B, C , depending on which authors are correct. Technically Climo is correct in following the types for these genera, but morally wrong, as his transferring of genera is confusing, and he does not follow Iredale and Powells intentions.

Submissions could be forwarded to the International Commission of Zoological Nomenclanture, claiming the reinstatement of Iredales **Mocella - Fectola**, also Powells **Subfectola.** This would retain stability, especially now that Powells N.Z. Mollusca has become like a bible. The treatment of these genera in that book would then be maintained, making it easier for future workers and students. There is much work to do. With this paper I hope to point out some of the anomalies and sticky areas that may be encountered.

THE ALTERNATIVES.

1. To follow Climo totally.
   a. **Fectola** for **Varicosa** group
   b. **Mocella** for **rakiura** group
   c. c. N Gen for **Maculata** group (N Gen A)
   d. **Cavellia** for **biconcava** group
   e. **Cavellioropa** for **subantialba** group (unpublished - pers com).
   f. N Gen for **vortex** group (N Gen B) (unpublished - pers com).

2. To follow Iredale, Powell and Dell.
   a. New Gen for **Varicosa** group (n GenC)
   b. **Subfectola** for **rakiura** group
   c. **Mocella** for **maculata** group
   d. **Fectola** for **biconcava** group
   e. **Geminoropa** (**Cavellioropa**) for **subantialba** group
   f. **Geminoropa (geminoropa)** for **vortex** group.

(1a) (2a)

The **varicosa** group.

Egestula charopiformis Gardner 1967	**Helix infecta** Reeve 1852
Fectola jamiesoni Climo 1978	**Patula jessica** Hutton 1883
Thaumatodon mira Webster 1908	**Charopa (Ptychodon) paytoni** Climo 1970
Fectola trilamellata Climo 1978	**Fectola unidentata** Climo 1978
Helix varicosa Pfeiffer 1853	

In Synonymy.

Thaumatodon iredalia Webster 1908	**Patula timandra** Hutton 1883
Helix zeta Pfeiffer 1853	
Thaumatodon Pilsbry 1893 (Sensu Webster - Suter)	**Fectola** Iredale 1915, Climo 1978

(1b) (2b) The **"Subfectola" eta** group

Charopa (Ptychodon) elliottae Climo 1969	**Helix eta** Pfeiffer 1853
Fectola (Subfectola) Rakiura Powell 1939	**Pseudallodiscus spelaeus** Climo 1971
Fectola (Subfectola) Powell 1939	**Mocella** Iredale 1915, Climo 1981.

(1c) (2c)

The maculata group

Charopa (Mocella) accelerata Climo 1970
Mocella manawatawhia Powell 1935
Charopa segregata Suter 1894
Patula corniculum var maculata Suter 1890
Endodonta (Charopa) prestoni Sykes 1895

In synonymy.

Mocella cogitata Iredale 1941
Endodonta (Chropa) Kenepuruensis Suter 1909

Mocella Iredale 1915, Non Climo 1981.

(1d) (2d)

The **biconcava** group

Helix anguicula Reeve 1852
Patula brouni Suter 1891
Patula colensoi Suter 1890
Patula infecta var irregularis Suter 1890
Fectola marsupialis Powell 1941
Patula sterkiana var reeftonensis Suter 1892
Patula sterkiana Suter 1891
Helix biconcava Pfeiffer 1853
Helix buccinella Reeve 1852
Charopa (Ptychodon) delli Climo 1969
Charopa (Ptychodon) marstoni Climo 1969
Patula mutabilis Suter 1891
Patula serpentinula Suter 1891
Patula tapirina Hutton 1883

In Synonymy.

Patula infecta var alpestris Suter 1891
Patula eremita Suter 1891
Endodonta (Charopa) otagoensis Suter 1913
Patula sterkiana (forma major) Suter 1892
Patula sylvia Hutton 1892
Endodonta biconcava (var minor) Suter 1913
Helix gamma Pfeiffer 1853
Endodonta (Charopa) roseveari Suter 1896
Endodonta (charopa) subinfecta Suter 1899
Patula variecostata Suter 1890

Fectola Iredale 1915, Non Climo 1978.

Note 3.

Helix anguicula Reeve 1852, British Museum. Climo 1983 page 157 in discussion =
Cavellia anguicula (Reeve 1852) Climo 1983.

(1e) (2e)

The **subantialba** group.

Geminoropa (Cavellioropa) cookiana Dell 1952
Endodonta (Charopa) vortex microrhina Suter 1909
Diplomphalus subantialba Suter 1909
Diplomphalus huttoni Suter 1890
Diplomphalus moussoni Suter 1890

In synonymy.

Cavellia o'connori Dell 1950
Cavellia spelaea Powell 1928

Geminoropa Iredale 1933

Geminoropa (Cavellioropa) Dell 1952

(1f) (2f)

The **vortex** group. (NSP in dumping ground)

Endodonta (Charopa) vortex Murdoch 1897
"Geminoropa" NSP Akatarawa Hill, Tararua Range (Roscoe)
Geminoropa " NSP ? Cave deposits. South Island (Roscoe)
'Geminoropa" NSP Stewart Island (Hazelwood)

Note 4.

Helix anguicula (Non Reeve) Suter 1913 =
Charopa pseudanguicula Iredale 1913– Kermadec Island type =
Phenacharopa pseudanguicula Iredale 1913, Climo 1983.

Note 5.

Investigate **Patula timandra** Hutton 1883. Reported as coming from North Auckland.
The following species are in this area.

Fectola infecta (Reeve 1852)
Fectola charopifromis (Gardner 1967)
Fectola mira (Webster 1907)
Fectola unidentata Climo 1978.

CHECKLIST OF THE N.Z. CHAROPIDAE (as of August 1990)

CHAROPINAE

Aeschrodomus Pilsbry 1892
Charopa Albers 1860
Chaureopa Climo 1985
Egestula Iredale 1915
Flammocharopa Climo 1970
Huonodon Iredale 1945
"Mocella" New Genus
Phenacharopa Pilsbry 1893
Pulchridomus Climo 1980
Cavellia Iredale 1915
"Charopa"
Damonita Climo 1981
Fectola Iredale 1915, Climo
Geminoropa Iredale 1933
Mocella Iredale 1915, Climo
Paracharopa Climo 1983
Pseudegestula Dell 1954

ROTADISCINAE

Alsolemia Climo 1981
Mitodon Climo 1989
Rotadiscus Pilsbry 1926
Loisthodon Climo 1989
Ptychodon Ancey 1888
Zealandiscus Climo 1989

New Sub Families?

Gerontia Hutton 1883
Therasiella Powell 1948
Montaropa Climo 1984
Suteria Pilsbry 1892

CHAROPIDAE - GENERA & SPECIES. (Charopinae).

Aeschrodomus Pilsbry
- **stipulata (Reeve 1852)**

Cavellia Iredale 1915
- **anguicula** (Reeve 1852)
- **brouni** (Suter 1891)
- **colensoi** (Suter 1890)
- **Irregularis** (Suter 1890)
- **marsupialis** (Powell 1941)
- **reeftonensis** (Suter 1892)
- **sterkiana** (Suter 1891)
- NSP (**infecta** in error)
- **biconcava** (Pfeiffer 1853) out of synonymy?
- **buccinella** (Reeve 1852)
- **delli** (Climo 1969)
- **marstoni** (Climo 1969)
- **mutabilis** (Suter 1891)
- **serpentinula** (Suter 1891)
- **tapirina** (Hutton 1883)

Charopa Albers 1860
- **coma** (Gray 1843)
- **pseudocoma** Suter 1894

"Charopa" Climo
- **bianca** Hutton 1883
- **pilsbryi** (Suter 1894)
- **montivaga** Suter 1894

Chaureopa Climo 1985
- **depressa** Climo 1985
- **microumbilicata** Climo 1985
- **subdepressa** Climo 1985
- **hazelwoodi** Climo 1985
- **roscoei** Climo 1985
- **titirangiensis** (Suter 1896)

Damonita Climo 1981
- **geminoropaformis** Climo 1981

Egestula Iredale 1915
- **bicolor** Climo 1973
- **gaza** (Suter 1909)
- **pandora** Gardner 1967
- **egesta** (Gray 1850)
- **microgaza** Climo 1973

Fectola Iredale 1915 (Climo)
- **charopaformis** (Gardner 1967)
- **jamiesoni** Climo 1978
- **mira** (Webster 1908)
- **trilamellata** Climo 1978
- **varicosa** (Pfeiffer 1853)
- **infecta** (Reeve 1852)
- **jessica** (Hutton 1883)
- **paytoni** (climo 1970)
- **unidentata** Climo 1978

<u>**Flammocharopa**</u> Climo 1970
costulata (Hutton 1883)
montana (Suter 1891)

<u>**Geminoropa**</u> Iredale 1933
cookiana (Dell 1952)
microrhina (Suter 1909)
subantialba (Suter 1909)
huttoni (Suter 1890)
moussoni (Suter 1890)
vortex (Murdoch 1897)

<u>**Huonodon**</u> Iredale 1945
hectori (Suter 1890)
microundulata (Suter 1890)
gadus (Dell 1954)
pseudoleioda (Suter 1890)

<u>**Mocella**</u> Iredale 1915 (Climo)
elliottae (Climo 1969)
rakiura (Powell 1939)
eta (Pfeiffer 1853)
spelaeus (Climo 1971)

<u>**'Mocella''**</u> (New Genus) Climo
accelerata (Climo 1970)
manawatawhia (Powell 1935)
segregata (Suter 1894)
Maculata (Suter 1890) out of synonymy
prestoni (Sykes 1895)

<u>**Paracharopa**</u> Climo 1983
chrysaugeia (Webster 1904)
fuscosa (Suter 1894)
rimu Climo 1985
delicatula Climo 1983
goulstonei Climo 1983

<u>**Phenacharopa**</u> Pilsbry 1893
novoseelandica (Pfeiffer 1853)
pseudanguicula (Iredale 1913)

<u>**Pseudegestula**</u> Dell 1954
brookesi (Dell 1954)
worleyi (Powell 1928)
transenna (Suter 1904)

<u>**Pulchridomus**</u> Climo 1980
barbatula (Reeve 1852)

Genus undetermined. (Status at present unknown). **Pitys cryptobidens** Suter 1891
Panbiogeography Seminar Handout: Climo indicates that **Cryptobidens** may be a **Rotadiscid.**

<u>Charopidae - Genera - Species</u> (Rotadiscinae)

<u>**Alsolemia**</u> Climo 1981
cresswelli (Climo 1978)
monoplax (Suter 1913)

<u>**Loisthodon**</u> Climo 1989
benhami (Suter 1909)

<u>**Mitodon**</u> Climo 1989
suteri (Murdoch & Findlay 1923)
wairarapa (Suter 1890)

<u>**Rotadiscus**</u> Pilsbry 1926
insularis (Climo 1978)
protoinsularis Climo 1989
takakaensis (Climo 1981)
jamiesoni (Climo 1978)
smithae (Dell 1954)

<u>**Zelandiscus**</u> Climo 1989
elevata (Climo 1978)
worthyi Climo 1989

CHAROPIDAE - Genera - Species (Other Groups)

Gerontia Hutton 1883
panthernia Hutton 1883

Montaropa Climo 1984

macsweeneyi Climo 1984

Therasiella Powell 1948
celinde (Gray 1850)
neozelanica Cumber 1967
serrata Cumber 1967
elevata Cumber 1967
pectinifera (Powell 1935)
tamora (Hutton 1883)

Suteria Pilsbry 1892
ide (Gray 1850)
raricostata Cumber 1962

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Goulstone 1990
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Goulstone 1984 — Goulstone 1990
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(sperceded bynext one)

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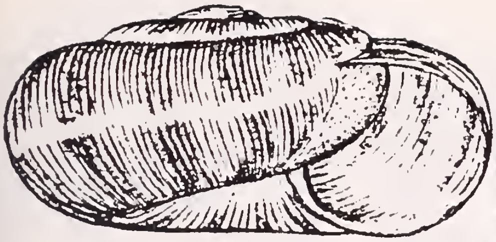
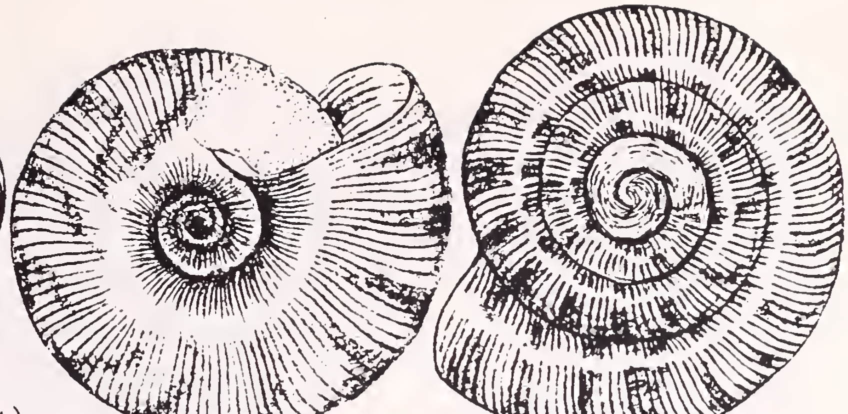
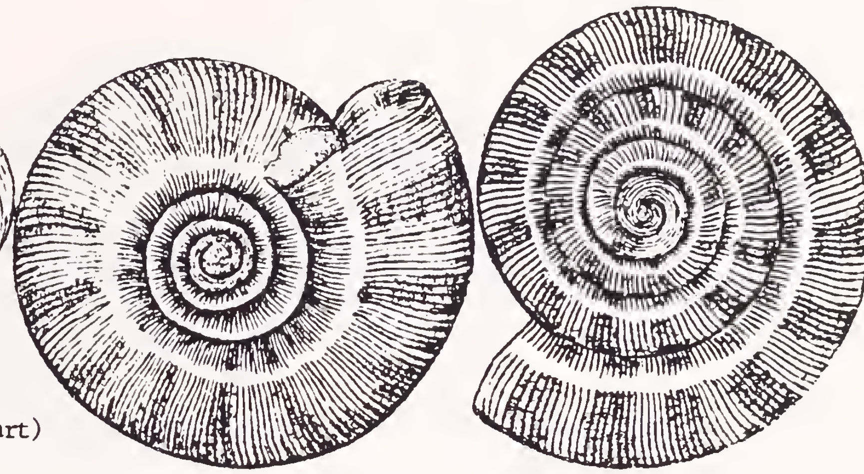




New Genus, **maculata** (Suter 1890)

Mocella eta (Non Pfeiffer) Suter (in part)

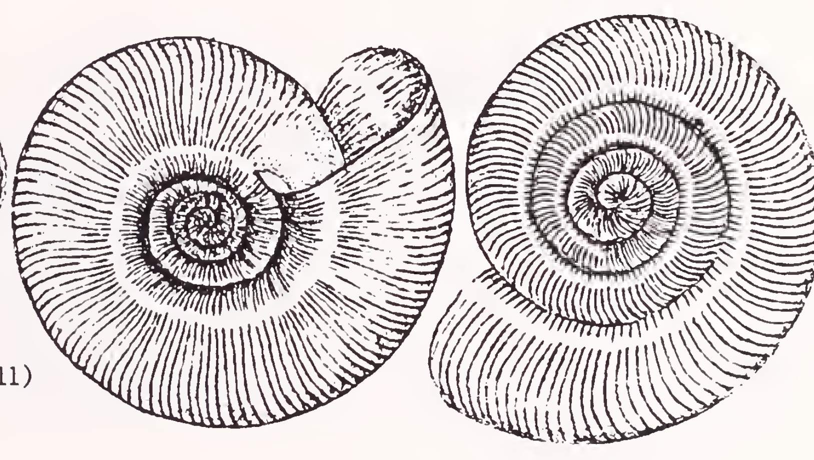
Dunedin (Southern) 3 x 1.5mm



New Genus (cf **maculata**)

Mocella eta (Non Pfeiffer) Suter (in part)

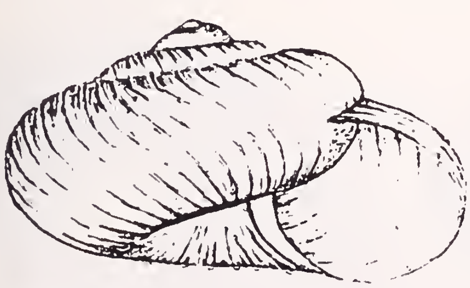
Auckland (Northern) 2.5 x 1.3mm

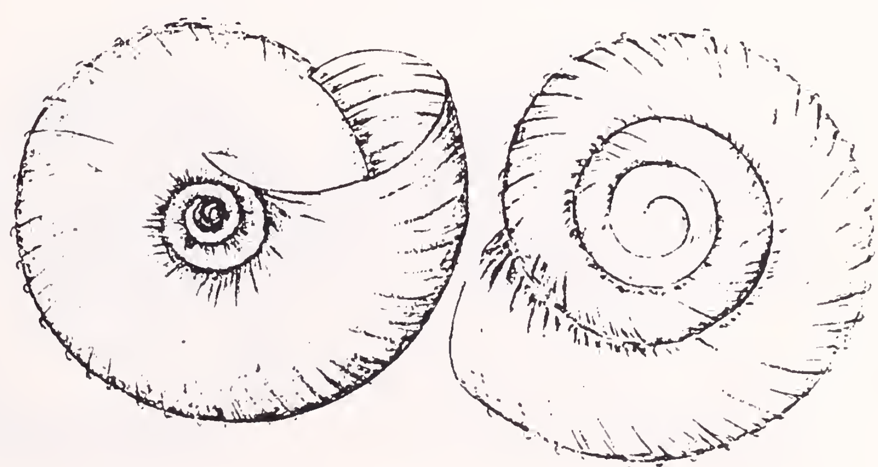


Mocella eta (Pfeiffer 1853)

(**Subfectola caputspinulae** (Non Reeve)Powell)

Auckland 2.5 x 1.2mm



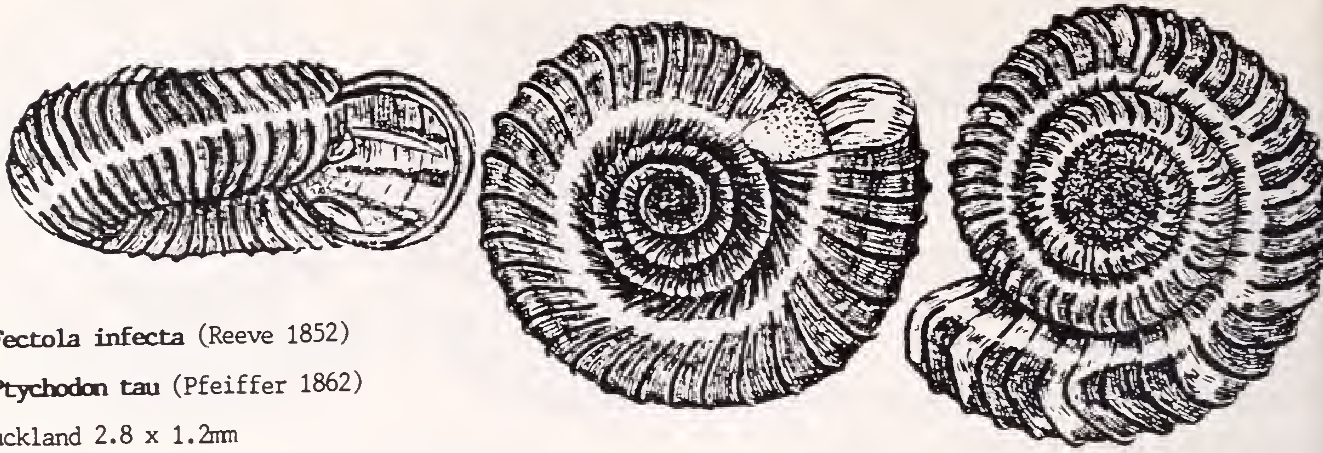


Paralaoma caputspinulae (Reeve 1852)

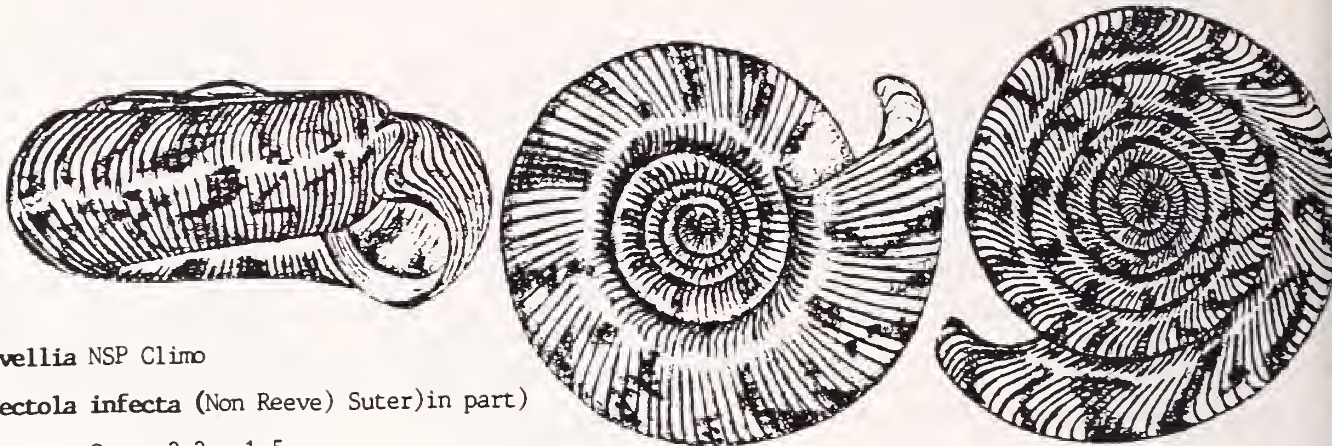
(**Paralaoma raoulensis** (Iredale 1913)

(**Paralaoma pumila** (Hutton 1883)

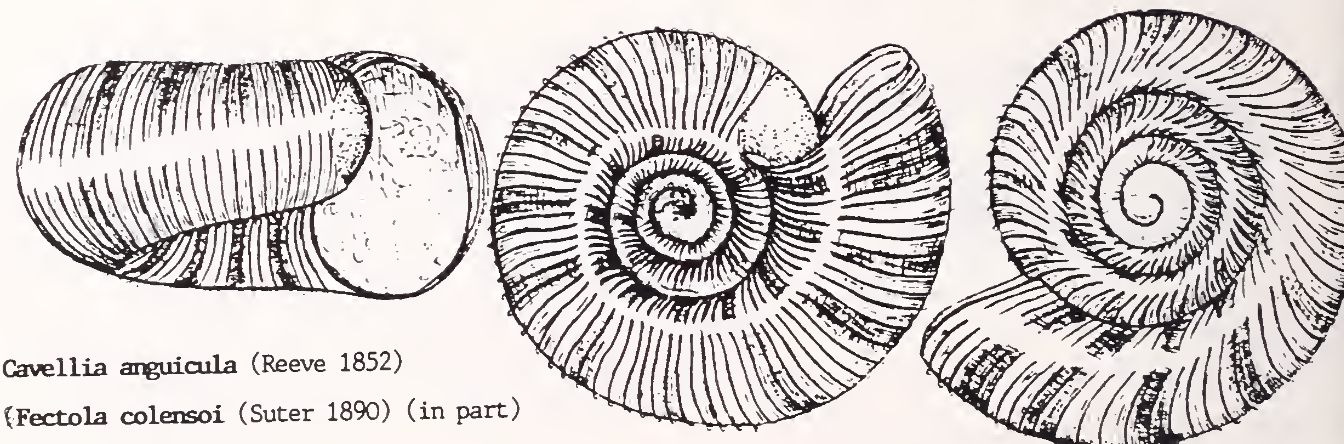
Auckland 2.2 x 1.4mm



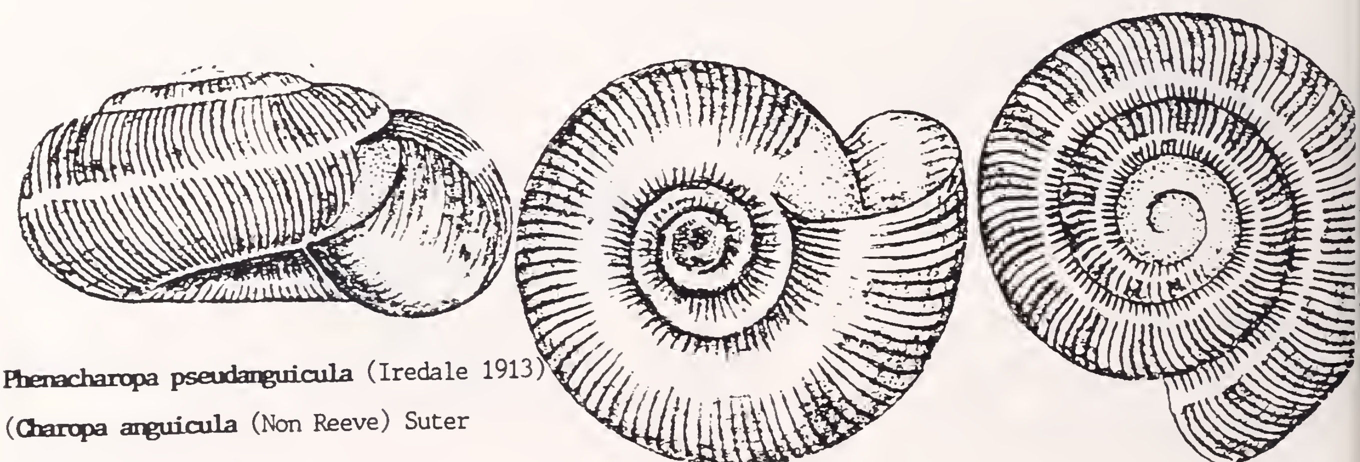
Fectola infecta (Reeve 1852)
(**Ptychodon tau** (Pfeiffer 1862)
Auckland 2.8 x 1.2mm



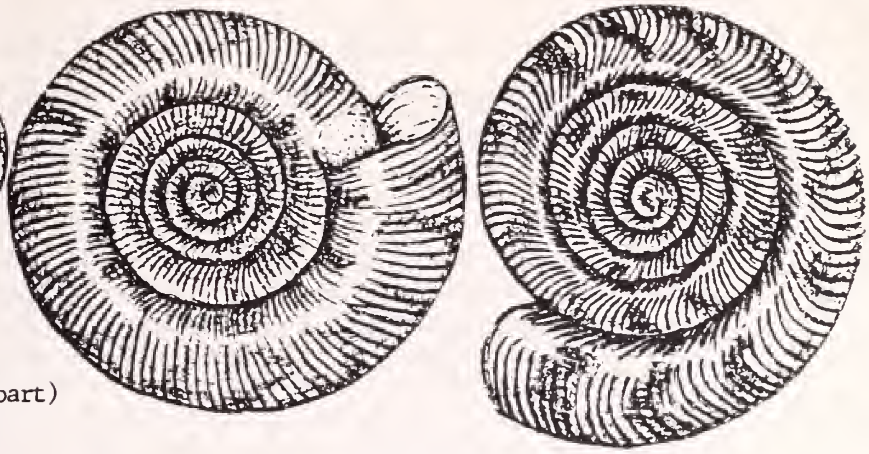
Cavellia NSP Climo
(**Fectola infecta** (Non Reeve) Suter)in part)
Manawatu Gorge 3.3 x 1.5mm



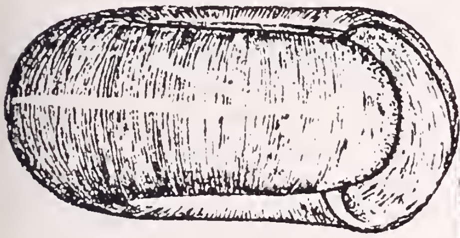
Cavellia anguicula (Reeve 1852)
(**Fectola colensoi** (Suter 1890) (in part)
Auckland 3.2 x 1.7 mm

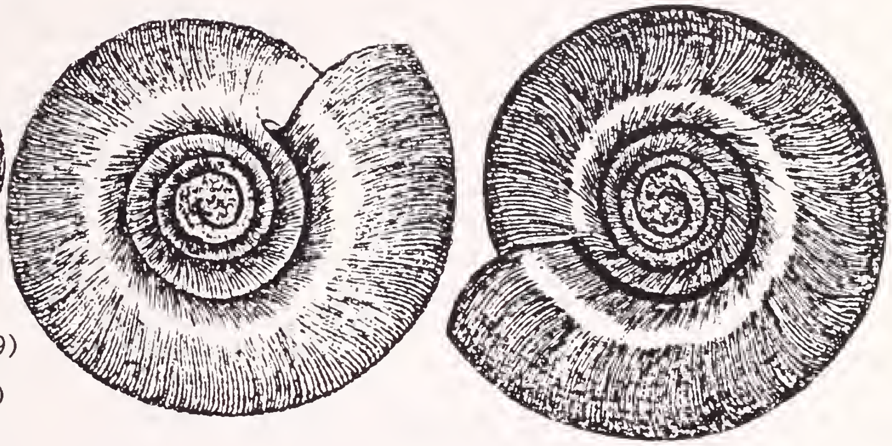


Phenacharopa pseudanguicula (Iredale 1913)
(**Charopa anguicula** (Non Reeve) Suter
Auckland 1.7 x 0.8mm

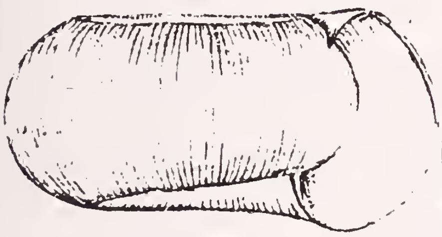


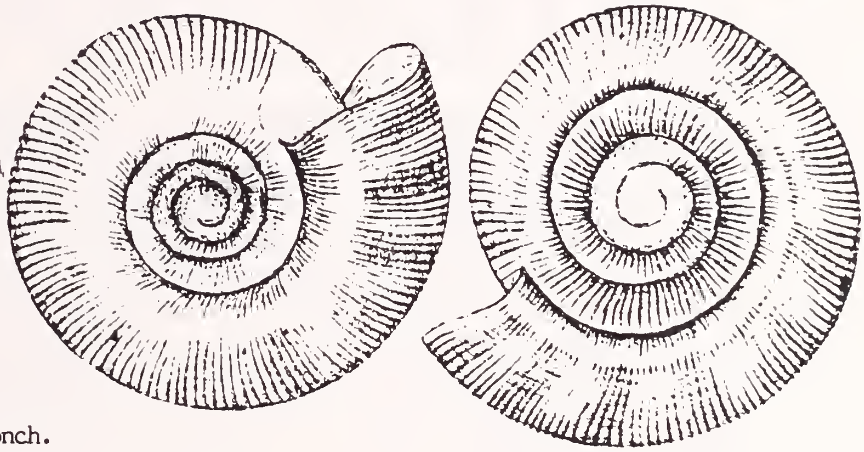
Cavellia biconcava (Pfeiffer1853)
(**Fectola infecta** (Non Reeve) Climo)
(in part)
Shannon, Manawatu 5.3.x 2.4mm



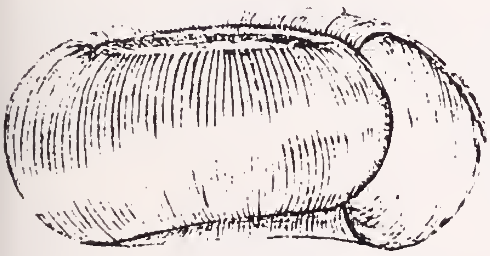


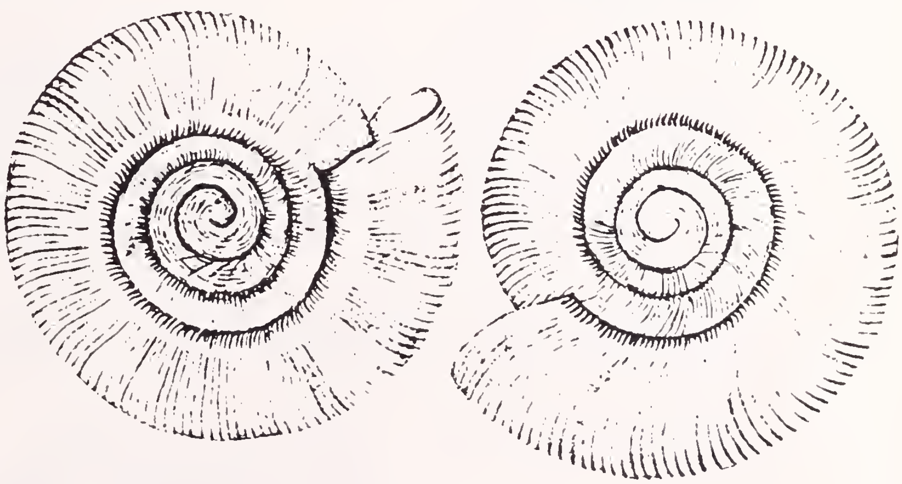
Cavellioropa subantialba (Suter 1909)
(**Geminoropa subantialba** (Suter 1909)
Wellington 1.5 x 0.7mm





New Genus **vortex** (Murdoch 1897)
(**Geminoropa vortex** (Murdoch 1897)
Auckland 1.5 x 0.8mm , smooth protoconch.





(**Geminoropa vortex** (Murdoch 1897)
Pureora 1.5 x 0.7 mm.

A Note Concerning Some Aquarium Snails in New Zealand

by Henk K Mienis

The two "species" of live bearing freshwater snails reported by Hazelwood (Poirieria 16(2): 52, 1990) from aquaria in New Zealand, represent forms of a single species Melanoides tuberculata (Müller,1774) in the family Thiaridae. This species is of Afro-Asian origin and its natural distribution covers large parts of North and East Africa; South-West, South and South-East Asia; North Australia and various Pacific Islands.

In natural populations males are usually present in small numbers only or are even completely absent. Therefore, parthenogenesis takes place as the means of reproduction amongst the females. Under favourable conditions the introduction of a single female may lead to the establishment of a new population. Within such a population the shells are rather constant in form, sculpture and colour. However, considerable variation might exist between shells belonging to different populations. This may explain the differences between the two adult specimens figured by Hazelwood.

The females are ovo-viviparous and reproduction is rather prolific: a single female may produce 150 or more fast growing young per year.

Melanoides tuberculata inhabits a large variety of habitats from fresh to nearly saline waters. Its heat tolerance is also rather amazing which accounts for its presence here and there in hot springs. In the last 30 years it has turned into a common worldwide aquarium snail.

Via aquaria and garden ponds Melanoides tuberculata has often escaped to natural habitats in many tropical and subtropical countries where the species did not occur previously. It managed to reach several hot water springs in Spain and Austria in this way, where it forms a constant danger to the existence of several rare endemic species. This potential for competing with local species has even lead to the deliberate introduction of it on several Caribbean Islands as a means of biological control of Biomphalaria glabrata (Say, 1818), an intermediate host of human schistosomiasis.

An interesting item in the life of M. tuberculata is that this snail shows a negative phototaxis i.e. it hides in the sand during daytime, emerging only during the night when it starts to search for all kinds of green algae and organic waste matter.

In summary I would say that M. tuberculata is an interesting aquarium snail which should remain confined to New Zealand aquaria. Already another aquarium snail Pseudosuccinea columella is causing too much trouble in New Zealand by serving as a major intermediate host for Fasciola gigantica, the fearsome liverfluke of sheep!

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SOME SUGGESTED NAME CHANGES

For identification most members would use "New Zealand Mollusca" by A.W.B.Powell, 1970, or Dr. Powell's earlier checklist, "Shells of New Zealand", the fifth edition of which appeared in 1976.
Since then however there have been quite a number of name changes advocated, some of which are listed below. They are taken from the recent publication "Cenozoic Mollusca of New Zealand", A.G.Beu and P.A. Maxwell, with due acknowledgement. This list should not be considered complete for it does not take into account the various living species recently described, which have no direct connection with the fossil horizons.

New combinations advocated.	Relevant genus in New Zealand Mollusca
Tucetona laticostata (Quoy & Gaimard,1835)	Glycymeris
Purpurocardia purpurata (Deshayes,1854)	Venericardia
Triostrea chilensis lutaria (Hutton,1873)	Ostrea
Oxyperus elongata (Q. & G,1835)	Longimactra
Elliptotellina urinatoria (Suter,1913)	Ascitellina
Hiatula nitida (Gray,1843)	Soletellina
" siliqua (Reeve,1857)	"
Moerella huttoni (Smith,1885)	Tellina (Tellinella)
Rexithaerus spenceri (Suter,1907)	" "
Serratina charlottae (Smith,1885)	" "
" eugonia (Suter,1913)	" "
Peronaea gaimardi (Iredale,1915)	" (Peronidea)
Tellinota edgari (Iredale,1915)	" "
Irus (Notirus) reflexus (Gray,1843)	Notirus
" (Notopaphia) elegans (Deshayes,1854)	Notopaphia
Euchelus alacerrimus (Dell,1956)	Herpetopoma
" bellus (Hutton,1873)	"
Nodilittorina cincta(Q&G,1833)	Littorina (Austrolittorina)
" unifasciata antipodum(Philippi,1847)	" "
Attenuata manawatawhia (Powell,1937)	Lironoba (Nobolira)
" orientalis (Dell,1956)	" "
Pusillina (Haurakia) hamiltoni (Suter,1898)	Rissoa (Haurakia)
" " infecta (Suter,1908)	" "
" " otagoensis (Dell,1956)	" "
" " subsuturalis " "	" "
Pissina angustata (Powell,1927)	Estea (Microestea)
" micronema (Suter,1898)	"
" minor (Suter,1893)	"
" rekohunua (Powell,1933)	"
" rufopicta (Suter,1908)	"
" zosterophila (Webster,1905)	"
Sassia palmeri (Powell,1976)	Proxicharonia
" parkinsoniana Perry,1811)	Austrotriton (Austrosassia)
Monophorus fascelinus (Suter,1908)	Triphora
Linatella caudata (Gmelin,1791)	a Ranellidae sp.

Note on Linatella caudata.
Beu & Maxwell say that Linatella caudata is one of the more common Ranellidae species in the fossil fauna of the eastern Bay of Plenty, but only one Recent specimen has been reported; washed up in central eastern Northland. They describe it as easily distinguished from other Ranellidae by its simple spiral structure and lack of varices and from Tonna which it also resembles, by its taller and narrower protoconch, lessinflated shell, taller spire and long anterior canal.

Norman Gardner
Nancy Smith

On the trail of <u>Turbonilla</u> by Margaret Morely

I found my first live <u>Turbonilla</u> by sieving the sand around low tide worm holes at Oneroa, Waiheke Island on August 8th 1987. In the same locality a year later the low tide was late in the afternoon. The low angle of the sun's rays silhouetted a hairline trail leading to an elongated bump in the sand. A live <u>Turbonilla</u> was soon extracted. Half an hour later eleven more specimens had been collected. Some of the trails started at worm holes.

Alerted to this way of detecting <u>Turbonilla</u> I found twelve specimens at Mellons Bay, Howick on September 7th 1970.

<u>Turbonilla</u> belong to the family <u>Pyramidellidae</u> which are ectoparasites. Powell (1979) in "New Zealand Mollusca" has this to say about them: "Although carnivorous the radula is absent, but they have an oral sucker and a buccal stylet that pierces the body of their host, and a sort of buccal pump extracts the victim's body juices. <u>Turbonilla</u> are of world-wide distribution; some roam freely in the substratum, but most favour a particular organism as host, which may be a polychaete worm, an echinoderm, a coelenterate, or a bivalve mollusc."

I examined the Mellons Bay specimens in seawater and sand under the microscope. This kept me totally absorbed for a whole evening!

<u>ANIMAL</u>: The body was semitransparent white with a narrow phosphorescent blue border similar to that of <u>Bullina</u> <u>lineata</u>. The heart could be seen through the shell halfway up the spire pumping at eightysix beats per minute. The eye spots showed through the body whorl allowing them to function even when the animal was partly withdrawn. The dark visceral mass extended into the protoconch.

<u>OPERCULUM</u>: Some were buff and some transparent white. They were barely visible except under high magnification.

<u>LOCOMOTION</u>: The animal was photosensitive, crawling rapidly away from a light source, then burying in the sand. The crawl was a series of jerks consisting of the foot being elongated, fixed in front, then contracted to pull the shell forward to the fixed point.

There were several adaptations to a sand habitat. The leading edge of the foot was thickened and acted like a snow plough. Mucus was secreted and carried

sand grains up and over the shell. The grains were deflected from the eyes and aperture by the wide triangular shaped head lobe which was convex anteriorly. Several specimens spent time crawling upsidedown on the surface of the water.

EGG CAPSULES: Four of the twelve specimens had an egg capsule securely attached to the spire. It was amazing to see inside each capsule the first whorl of the protoconch with its vigorously moving animal surrounded by transparent jelly.

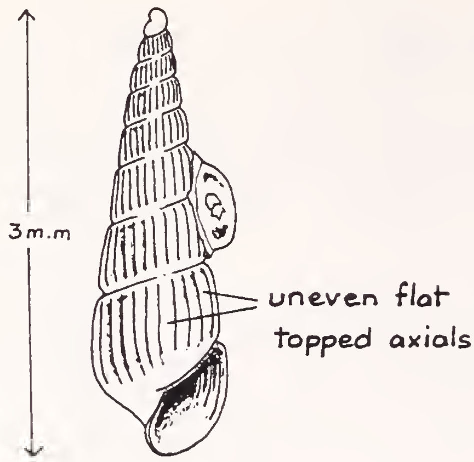
Presumably attaching the egg capsule to an adult shell ensures that the juvenile starts life near the desired host. Ten *Turbonilla* were collected at Mellons Bay on March 20th 1991, but only one had an egg capsule attached. However, it was ruptured and full of sand grains. Further collecting is required to determine when most egg laying occurs.

IDENTIFICATION: Despite much checking and comparison I cannot positively identify which *Turbonilla* species I have collected. There is considerable variation in shell proportions, convexity of the whorls, and in the type and number of axials. The average height of the shells is 3mm. A majority have wide flat topped axials with narrow interspaces and are probably *Turbonilla bucknilli*. A few shells have narrow rounded axials and could be *Turbonilla errabunda*. The number of axials on the penultimate whorl varies between sixteen and thirty. To add to the confusion for T. *bucknilli*, in "New Zealand Mollusca" the number of axials on the penultimate whorl is given as "about twenty"; whereas in Law's paper it is given as "about fourteen".

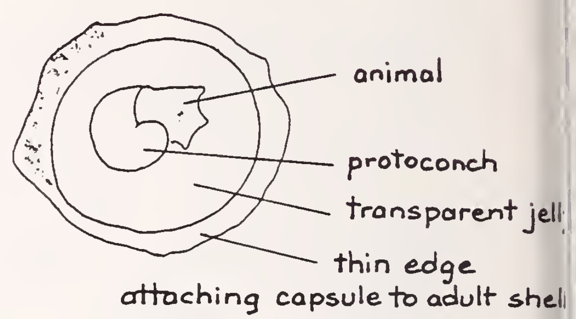
So far the only other member of the *Pyramidellidae* that I have collected in trails is a single specimen of *Odostomia pudica*. Unfortunately I did not examine it alive under a microscope.

So if you see me progressing at a molluscan pace (with the occasional jerk) along a beach with the sun low and behind, you will know exactly what I am doing! If you try the method and have success I would be interested to compare specimens

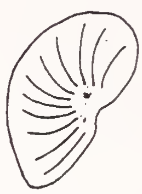
<u>Turbonilla</u> <u>bucknilli</u> (Laws, 1937) with egg capsule



Enlargement egg capsule

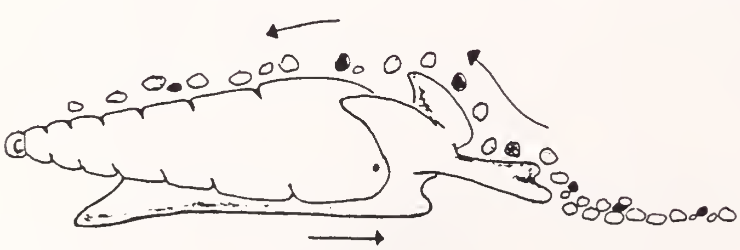


Operculum



From above

Sand grains passed over shell during locomotion



Underside of foot when animal upsidedown on water surface.

An Intertidal Record of Cadlina willani Miller, 1980
by Margaret Morely

Flat Island is the largest of the Pig Islands which lie just off the west coast of Great Barrier Island. On the 8th of February 1991 a calm evening allowed my husband and I to anchor our yacht off the exposed northern bay. Later as the tide went out we had to reposition the boat as threatening rocky outcrops appeared all around. A row around the bay as the sun set showed it would not be easy to beach the dinghy. Swells rolled in on either large inhospitable boulders or jagged volcanic outcrops. A relatively quiet spot was eventually found.

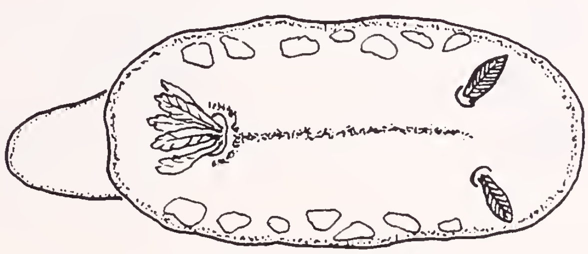
Low tide was early next morning. The resident skinks popped out from under each boulder as the sun's rays reached them. While putting on my wet suit and getting ready to snorkel I couldn't resist casting shadows to make the skinks pop back under! The clear water just offshore had many gullies and rocks covered with brown algae. As I parted algae a small white nudibranch was revealed crawling on the rock. At first I thought it was Chromodoris aureomarginata, but the central yellow stripe was distinctive. It was my first sighting of Cadlina willani.

The extended length was 11mm. The body was transparent white with opaque white blotches near the margin. There was a lemon yellow border on the margin and a thinner yellow border on the tail. The central yellow line ran from the rhinopores to the gills, where it divided and partly surrounded the gill plume.

I am indebted to Dr R C Willan who gave me the following information: of the 23 records of Cadlina willani the shallowest was 7m off the Mokohinau Islands. The Flat Island specimen is the first intertidal record.

REF: "Marine Molluscs Part 2 Opistobranchia"
Richard Willan & John Morton Page 90

Cadlina willani Miller, 1980



KEY
yellow line
opaque white blotches

Recluzia rollandiana washups in the far north
by Fiona Thompson

It was my pleasure to be one of the party on the clubs Easter trip to the far north this year. Our base was the Granges overflow bach at Houhoura where we were in reasonable striking distance of the beaches of interest; returning each evening to great communal meals and the sharing of our exciting finds.

Margaret Morely had been snorkling at Paua, Parengarenga Harbour prior to our arrival, and had come up with several *Bullina lineata* which spurred us to return on Easter Friday to see if she had left any! She hadnt, but walking to the small island left high and dry at low tide we found several *Natica migratoria*, *Polinices simiae*, and on the island itself *Ranella australasia*.

The following day several of us went to Cape Maria van Diemen, scanning the tide line as we went along, since Rae Sneddon had found a *Recluzia* on a previous trip. Crossing the sand dunes we could see evidence that wild pigs were rooting round what little vegetation was still growing, and that the visible subfossil remains were being trampled. There was an abundance of single valves of *Gomphina* and *Venericardia reinga*, a few keyhole limpets, and a couple of *Trivia merces*.

Returning to the Granges that evening, Peggy Town and Rae Sneddon were being very secretive and unforthcoming about their day at Twilight Beach. However, at dinner they made a dramatic announcement of a washup of *Recluzia rollandiana*, having found about forty that day.

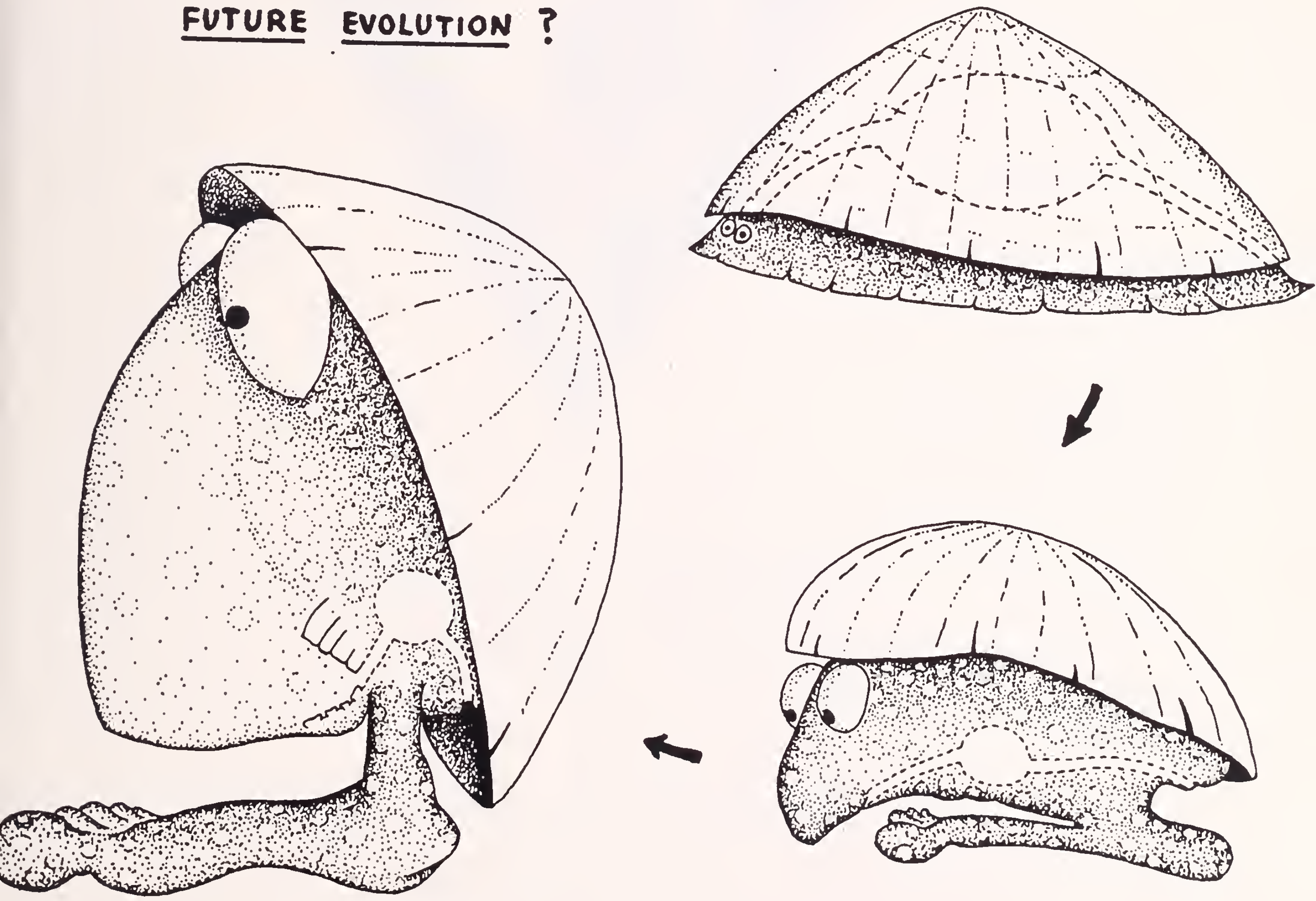
Easter Sunday saw us in small groups on Ninety Mile Beach with high hopes of similar finds. Walking first to the Bluff and then to Te Paki, following behind Rae and Peggy, I found thirty *Recluzia*; and other groups arriving later also found more. Apart from these, I also found some albino *Dosinia anus*. After lunch we went to Spirits Bay and found a few more *Recluzia*; together with a good number of *Tanea zelandica* and *Cirsotrema zelebori* washed up around the island; and *Marginella vailei* in some of the rock pools.

On the Monday Margaret and I went to Kaimaumau where there were masses of *Tawera spissa* and *Cantharidus purpureus*, and several *Trivia merces*. *Amalda depressa* were also flourishing there, and Margaret found a few *Philine angasi*. Most of the others had started off to Great Exhibition Bay, but a cloudburst sent them scurrying and they went back to Ninety Mile Beach instead. Kevin Burch, with Canadian visitors Judy and

Tom Ness, went by their yacht to an island in the harbour to look for Philippia lutea. Despite our requisition of one each, they only came back with two! While the rest of us returned home, the Towns and Rae stayed on a further day and did get to Great Exhibition Bay where they found more Recluzia.

It is estimated that between all of us about three hundred Recluzia were found - enough to share with everybody. Who knows how long it will be before another such washup bonanza occurs?

FUTURE EVOLUTION ?



POIRIERIA

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EDITORIAL:

If you talk to any marine biologist they will tell you that changes are occuring to our coastline as a result of man's activities. These changes are particularly evident in sheltered harbours and estuaries where population densities are high and recreational activities on the water popular. However, it is a different matter when you ask these same biologists to identify the precise nature of these changes. While this is in part due to seasonal fluctuations in populations and similar natural phenomena, it is also due to a failure of people to keep accurate records of the "way things used to be". In this regard it is not sufficient to say "well Muricopsis octogonus were common on the North Shore Bays twenty years ago"; as scientists need more precise data than this to evaluate changes.

I believe that club members can play a major role in providing this baseline data. To do this we need to monitor a particular stretch of coastline and regularly count species numbers. This can be done by taking photographs (for species living on top of the rocks or sandflats), by counting the number of specimens found in a particular area, or by counting the number of specimens found in a particular time period. If this is done regularly a couple of times a year, then over the years very useful records will emerge. These could then be published in "Poirieria", providing valuable data for future scientists. In addition, for conservationist members, it only requires you to count - not collect - specimens.

Ian Scott

CONTENTS: PAGE

A NEW MEMBER OF THE MESODESMATIDAE.

MICHAEL K. EAGLE.

The known record of *Paphies* Lesson, 1831 is sparse. Other than Pleistocene and Pliocene specimens collected at such well known tertiary localities as Cape Kidnappers, Kai-iwi, Castlecliff, and Titirangi in the Chatham Islands, only one other species, *Paphies anteaustrale* (Dell, 1950), predates Mangapanian (*Wm*- approx.2.4 million years) records by about 19 million years. With our record of fossil, shallow, estuarine deposits, such a large gap in the fossil record has, for some time, intrigued conchologists and paleontologists alike. With perhaps the exception of *P.?pliocenicum aff. donacina*, which I consider to be worthy of future investigation (found at Kai-iwi), the following is a list of *Paphies* species as currently acknowledged.

SUBCLASS	:	HETERODONTA	
ORDER	:	VENEROIDEA	
SUPERFAMILY	:	MESODESMATACEA	
FAMILY	:	MESODESMATIDAE	
GENUS	:	*Paphies*	Lesson, 1831
SPECIES	:	*anteaustrale*	(Dell, 1950)
	:	*australe*	(Gemelin, 1791)
	:	*crassiformis*	(Marshall and Murdoch, 1920
	:	*donacina*	(Spengler, 1793)
	:	*?pliocenicum aff.* donacina	Oliver, 1923
	:	*subtriangulata*	(Gray in Wood, 1828)
	:	*ventricosa*	(Gray, 1843)

Four recent species, P. ventricosa, P. subtriangulata, P. australe, and P. donacina, are found at various localities around New Zealand and the Auckland Islands. A Chatham Island form of 'subtriangulata' (Smith et.al.,1989) previously thought to be a seperate species, P. porrecta, is another.

Seven species, P. ventricosa, P. subtriangulata, P. australe, P. donac P. porrecta, P. crassiformis, and P. anteaustrale constitute the fossi record (Beu and Maxwell, 1990). The type locality of P. anteaustrale is at Waikowhai, Manukau Harbour, which is Otaian (Po-approx.22 millio years). P. crassiformis is found at Okauawa Stream, inland Hawkes Bay, and at the type locality, Nukumaru Beach. The type locality of P. porr is Titirangi Sand, Titirangi Point, Karewa Peninsula, Chatham Island. Like P. crassiformis, P. porrecta is dated Nukumaraun (Wn-approx.1.8 million years). Similar forms are found in Tangoio limestone, also Nukumaraun, Napier. P. donacina is the abundant "southern tuatua" now living on South Island and some North Island beaches. It is found foss from ?Mangapanian (Wm-approx.2.4 million years) to Recent at Wanganui Fossil localities with P. ventricosa (Castlecliffian-Wc-approx.1 milli years to Recent), P. australe (Nukumaraun-Recent), and P. subtriangula (Haweran-Wq-approx.0.4 million years to Recent).

Collections in January and March of this year from the basal Waitamata beds at Hays Stream (R12/863566-f72), produced a diverse molluscan fauna from various communities (Hayward and Eagle in prep.). A further collection of these Otaian (approx.22 million years) fossils by the author at the beginning of May included a specimen of the Mesodesmatidae family tentatively assigned to '*Paphies*'. Morphological characteristics suggest that this may be an ancestor of the 'tuatua', *P. subtriangulata* (Fig.1.).

A schematic diagram of a possible phylogeny incorporating fossil and recent *Paphies* (Fig.2.) still indicates no ancestor for the 'toheroa', *P. ventricosa*. Some paleontologists have suggested that this species, along with P. subtriangulata, migrated to New Zealand via warm northern currents sometime in the Otaian, or between the Otaian and the Pliocene. This would have explained the absence of both ealier in the fossil record.

The discovery of a new Lower Miocene '*Paphies*' with definate similarities to recent *P. subtriangulata* should give hope to collecting further ancestral specimens.

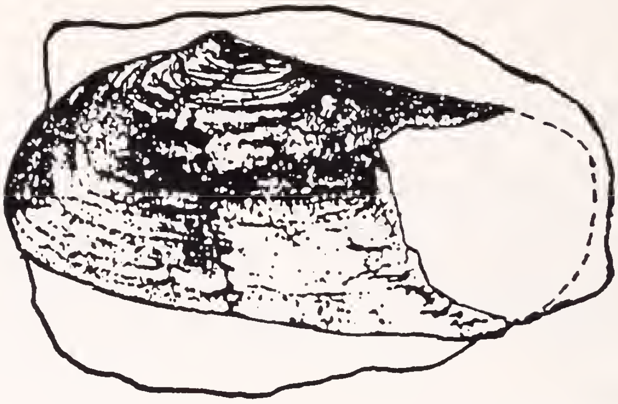

FIG.1. Single valve specimen of the Mesodesmatidae family tentatively assigned to 'Paphies' which was found in an Otaian (Po-approx.22 million years) sandstone clast at Hays Stream, Hunua Road, South Auckland R12/863566 (f72).

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POSSIBLE PHYLOGENY

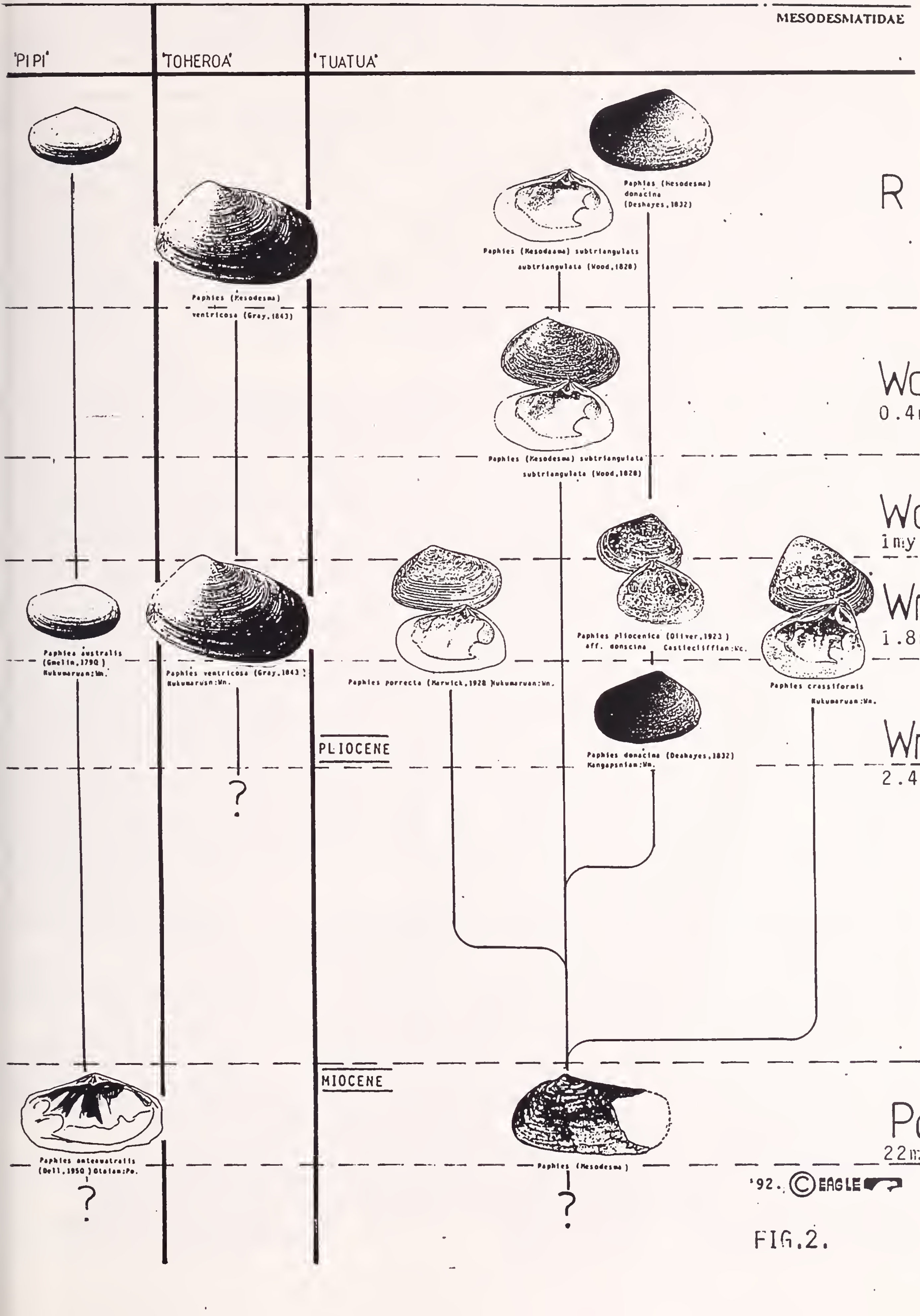


FIG.2.

THE LAND SNAILS OF DUSKY AND BREAKSEA SOUNDS, FIORDLAND (SNAILING WITH THE RATBUSTERS).

D. Roscoe

Below is the full first draft of a report on a collecting trip in Breaksea Sound, Fiordland. It came about when Bruce Thomas (lizards) had been giving me bags of leafmould to sort out the snails from islands in Dusky and Breaksea Sounds, to add to the scientific value of his work there. Rowley Taylor, also from the D.S.I.R. in Nelson, was unable to go on the last trip of the rat eradication programme, and I was invited (having been unable to accept previous offers) to go instead.

Bruce is a likeable companion. Doing first-rate scientific work, he calls himself "only a technician". Also, he's fit enough to scramble over greasy steep rock faces in storm conditions. I was open-mouthed at Christchurch Airport on the way down when Bruce wanted to ring somebody: there were two coin phones with huge queues, and heaps of card phones vacant; Bruce said, "I wish I had a phone card" and an attractive lady promptly walked up, saying "Excuse me sir, would you like this phone card, I won't have any use for it now, and it's got some time left on it." (Nice guys don't finish last!)

We arrived at Te Anau to hear that the foul weather (winds gusting to 55 knots) would prevent the boat leaving from Dusky Sound, so some of the party would be flown to Breaksea Island to begin operations. The question was, who? Bruce asked for me to go, but was politely refused, and a few DoC rangers went instead. We spent the night with Ron and Robin Peacock and their children, with much interesting conversation and a most pleasant evening. Robin is interested in becoming involved with land snail studies and the Peacocks would be most useful contacts in a fascinating area.

We went across Manapouri and over the pass (giant slugs seen there, but no time to collect!) into Dusky Sound. We sailed to the sea end of the sound; Lance the captain then decided he could make it to the island, and we took off into a wall of water. We were all sent below decks while we could still tell up from down, and arrived groggy but alive three hours later.

It was then we started to find out why the DoC field staff were there. The whole island had been set with rat bait stations at 25m intervals up the ridges, and tracks had been cut round the island horizontally (using an altimeter) at every 60m level, with bait stations every 50m. Since the rats were now gone, the traps were being removed. Also, to our horror, the horizontal-track markers and the two small huts at the peak(360m) and SW bivvy. In Fiordland conditions, the markers and huts would be invaluable for ongoing (and current) scientific work, making precise locality listings possible and making trips to the more remote (from base hut) areas much easier. As a paid-for guest I couldn't complain too loudly, but Bruce did all he could to protest about the expensive removal of these facilities. I arranged for the field staff to collect bags of leafmould from around as many of the bait stations as they could manage without affecting their work, and they cheerfully brought back lots of little bagfuls (just as well they weren't larger, as extracting the snails was time-consuming). We tried to "hit" many sites where the station tags & track markers remained. The base hut has a large table, running water, large windows and a hot shower!

Bruce had head lamps arranged, so we checked out the vegetation at the dead of night on two occasions. Phelussa henryi was crawling along flax leaves and Anisotome, with the local athoracophorid slugs and a cleverly camouflaged green spider- you could look straight at it, a few centimetres from a flax leaf, and not see it, even knowing it was there. All leaf litter samples we took were labelled in pencil on waterproof paper, at Bruce's suggestion. The stuff passed the sternest tests (picture me on a steepish bit at an odd angle, with alternate streams of mud and rainwater chasing themselves over the bit of paper I was writing on) and stays legible in alcohol.

We were at the southern end of the remote SW beach when Bruce noticed something: a fiordland skink (Leiolopisma acrinasum). No lizards had ever been seen on Breaksea Island, but were known from a small stack nearby; it was thought that they regularly would surf across and get gobbled by rats, and Bruce wanted to get permission to transfer some on the basis that with the rats gone they would establish themselves there eventually. Forty or so specimens of all age groups were in evidence on Breaksea; imagine his excitement!

We discovered how "Phrixgnathus stewartensis" gets about: shaded parts of high-tidal driftwood and kelp holdfasts were covered in the snails, over 20m from the nearest plants. That species and "Phrixgnathus rakiura" were abundant on tiny islands only a few metres high with almost no plants, so must be very salt-tolerant. We found Thermia cressida only on: Nothofagus treetrunks, a roof under Nothofagus, and on the ground touching a Nothofagus trunk.

Before the trip I wrote a list of expectations (in Appendix B below, left column) matched by a subsequent list of modifications (right column).
One thing which could well be added to the list of recommendations would be a regularly updated map of which local areas have been sampled for landsnails, so that a special effort could be made to look at blank spots on the map. Hopefully one day we'll be able to print out such maps automatically from computer databases.

7.3.1991

BREAKSEA AREA: SUMMARY OF LANDSNAIL DATA

(NOTE: in the tables below, columns marked "p" refer to preserved specimens. The left figure in each refers to the number of specimens, and the right figure refers to the number of localities at which it was found. Thus before 1990, 13 empty shells of Phacussa henryi were found at 9 localities, and 6 preserved specimens were found at 5 localities.)

BREAKSEA ISLAND:

	to 1990		p		1990		p		
athoracophorid sp.	-	-	1+1e	2	-	-	9	3	
Phacussa costata	-	-	-	-	6	1	-	-	
Phacussa henryi	13	9	6	5	80	29	21	10	
Phenacharopa pseudanguicula	2	1	-	-	-	-	-	-	
Thermia cressida	-	-	1	1	5	4	1	1	
charopid "n.gen.3 n.sp.C"	-	-	-	-	-	-	2	1	
Flammulina aff.lateaperta	-	-	1	1	1	1	5	1	
flammulinid cf.pilsbryi	-	-	-	-	6	3	-	-	
Potamopyrgus antipodarum	-	-	-	-	-	-	8	1	
Cytora n.sp.cf.annectens	5	5	1	1	72	24	10	6	
Cytora chiltoni	-	-	-	-	10	4	-	-	
Cytora cf.pannosa	-	-	-	-	-		1	1	
punctid 1988:203 (ARCrar)	-	-	-	-	3	1	4	2	
punctid 1988:cf200(CYTnsp)	-	-	-	-	-		1	1	
Phrixgnathus stewartensis	31	5	98	1	16	11	64	3	
punctid 1988:113 (DORpar)	29	8	6	5	21	8	14	4	
punctid 1988:187 (HAZcry)	3	3	1	1	3	3	-	-	
punctid 1988:214 (HESnot)	-	-	-	-	18	10	2	2	
Paralaoma allochroida	19	9	6	3	76	25	3	2	
punctid 1988:69 (IOTgrc)	1	1	-	-	-	-	-	-	
punctid 1988:15 (KOKmat)	5	3	-	-	13	6	2	1	
Phrixgnathus rakiura	2	2	18	2	513	9	66	10	
punctid 1988:42 (MERaus)	9	7	8	6	26	14	15	7	
punctid 1988:88 (MICimp)	9	5	7	5	16	8	6	4	
punctid 1988:84 (MICmin)	-	-	1	1	8	5	1	1	
Phenacohelix subantarctica	-	-	-	-	8	4	-	-	
Phrixgnathus celia	-	-	1	1	-	-	-	-	
punctid 1988:116 (PRSmay)	4	1	1	1	39	7	5	1	
Flammulina miserabilis	1	1	-	-	4	2	-	-	
punctid 1988:114 (ROSglo)	39	11	11	8	17	6	8	3	
Phrixgnathus campbellicus	27	15	1	1	21	12	-	-	
punctid 1988:181 (TAGpse)	16	6	-	-	93	14	4	3	
Allodiscus austrodimorphus	1	1	1	1	6	6	2	2	
Allodiscus aff.planulatus	-	-	1	1	1	1	-	-	
Allodiscus fectoloides	-	-	-	-	1	1	-	-	
Allodiscus aff.turbotti	3	3	-	-	9	6	1	1	
Cavellia cf.colensoi	5	4	5	1	84	21	20	10	
Cavellia aff.sylvia	14	8	36	14	81	17	52	20	
"Damonita" aff.eta	1	1	3	3	5	5	4	4	
Huonodon gadus	-	-	-	-	-	-	4	1	
Paracharopa bianca	-	-	-	-	1	1	-	-	
Phenacohelix cf.pilula	-	-	3	3	-	-	-	-	
Ptychodon blacki	2	1	3	3	2	2	11	8	
Mitodon wairarapa	-	-	1	1	-	-	-	-	
totals	241	110	223	72	1265	271	346	114	2075 spec.
		464				1611			

GILBERT ISLAND NO.1:

			p	
Phacussa henryi	1	1	-	-
Flammulina miserabilis	1	1	-	-
Phrixgnathus rakiura	22	4	5	2
punctid 1988:42 (MERaus)	1	1	1	1
Cavellia cf.sylvia	2	2	1	1
	27	9	7	4

34 specimens

GILBERT ISLAND (OUTER), NO.3

			p		
Phrixgnathus rakiura	301	1	359	1	
Phrixgnathus stewartensis	511	1	195	1	
	812	2	554	2	1366 specimens

THE LAND SNAILS OF DUSKY AND BREAKSEA SOUNDS: data summary

ENTRY ISLAND, BREAKSEA SOUND:

	to 1990		p		1990		p		
Phacussa henryi	1	1			4	2	1	1	
Phenacharopa pseudanguicula	-	-	-	-	-	-	1	1	
Flammulina zebra	-	-	-	-	1	1	4	1	
flammulinid pilsbryi?	-	-	-	-	-	-	6	1	
flammulinid cf.pilsbryi	-	-	-	-	-	-	1	1	
Cytora cf.annectens	1	1	-	-	-	-	-	-	
punctid 1988:133 (DORpar)	25	1	-	-	15	2	-	-	
Paralaoma allochroida	11	1	-	-	11	2	-	-	
punctid 1988:97 (LITord)	1	1	-	-	-	-	-	-	
Phrixgnathus rakiura	-	-	-	-	2	1	-	-	
punctid 1988:42 (MERaus)(?)	1	1	1	1	26	1	2	1	
punctid 1988:88 (MBRimp)	-	-	2	1	4	2	-	-	
punctid 1988:84 (MICmin)	-	-	-	-	9	2	-	-	
Phenacohelix subantarctica	1	1	5	2	-	-	-	-	
Phrixgnathus celia	-	-	-	-	-	-	12	1	
punctid 1988:116 (PRSmay)	-	-	-	-	2	1	-	-	
Flammulina miserabilis	1	1	-	-	-	-	-	-	
punctid 1988:114 (ROSglo)	-	-	1	1	-	-	-	-	
Phrixgnathus serratocostat.	-	-	-	-	3	1	-	-	
Phrixgnathus campbellicus	2	2	1	1	8	2	-	-	
Cavellia cf.sylvia	12	2	13	3	3	1	4	1	
"Damonita" cf.eta	4	1	2	1	2	1	-	-	
Huonodon gadus	-	-	-	-	1	1	27	1	
Mitodon cf.wairarapa	-	-	1	1	-	-	-	-	
Ptychodon blacki	1	1	2	1	2	1	-	-	
	61	15	28	12	93	20	58	9	240 specimens

HAWEA ISLAND, BREAKSEA SOUND

	to 1990		p		1990		p		
Phacussa henryi	3	2	1	1	7	3	1	1	
flammulinid cf.pilsbryi	-	-	-	-	2	1	-	-	
Cytora cf.annectens	-	-	-	-	3	1	1	1	
Phrixgnathus stewartensis	160	23	34	11	5	3	5	2	
punctid 1988:133 (DORpar)	36	3	19	8	-	-	-	-	
punctid 1988:214 (HESnot)	-	-	2	1	1	1	-	-	
Paralaoma allochroida	-	-	2	2	1	1	-	-	
punctid 1988:15 (KOKmat)	-	-	-	-	-	-	2	2	
Phrixgnathus rakiura	3	2	7	2	-	-	-	-	
punctid 1988:42 (MERaus)	131	12	25	4	21	6	5	1	
punctid 1988:88 (MICimp)	3	2	-	-	1	1	-	-	
punctid 1988:84 (MICmin)	-	-	2	2	-	-	-	-	
Phrixgnathus celia	1	1	-	-	-	-	-	-	
Flammulina miserabilis	15	2	-	-	2	1	-	-	
punctid 1988:114 (ROSglo)	9	3	-	-	5	2	2	2	
Phrixgnathus campbellicus	6	5	1	1	8	4	-	-	
Allodiscus austrodimorphus	-	-	-	-	2	2	-	-	
Allodiscus cf.planulatus	-	-	-	-	1	1	-	-	
Cavellia cf.colensoi	13	5	14	4	26	3	1	1	
Cavellia cf.sylvia	5	3	6	2	11	2	3	3	
Paralaoma allochroida	31	7	-	-	-	-	-	-	
	416	70	113	38	96	32	20	13	645 specimens
		529				116			

NORTHERN SHORE, RESOLUTION ISLAND: pre-1990

			p		
athoracophorid sp.	-	-	5e+1	2	
Phacussa costata	-	-	2	1	
Phacussa henryi	1	1	-	-	
Thermia cressida	-	-	1	1	
Cytora cf.annectens	2	1	-	-	
Cytora cf.chiltoni	-	-	1	1	
Cytora cf.pannosa	-	-	1	1	
Phrixgnathus rakiura	1	1	-	-	
punctid 1988:42 (MERaus)	-	-	6	3	
punctid 1988:88 (MICimp)	1	1	-	-	
Phrixgnathus celia	5	2	-	-	
punctid 1988:114 (ROSglo)	6	3	-	-	
punctid 1988:121 (RSPnel)	3	1	-	-	
Phrixgnathus celia	4	2	-	-	
Phrixgnathus campbellicus	5	2	-	-	
Cavellia cf.sylvia	-	-	2	2	
Mitodon wairarapa	-	-	2	2	
	28	14	21	13	49 specimens

OTHER MORE NORTHERLY ISLANDS IN FIORDLAND:) pre-1990

			p	
?athoracophorid egg	-	-	3	1
Phacussa henryi	2	2	-	-
punctid 1988:63 (AUSare)	19	1	-	-
Phrixgnathus stewartensis	5	3	21	2
punctid 1988:133 (DORpar)	6	1	1	1
Paralaoma allochroida	8	1	-	-
punctid 1988:69 (IOTgrc)	2	2	-	-
punctid 1988:14 (KOKmon)	8	1	4	1
punctid 1988:97 (LITord)	5	2	2	1
Phrixgnathus rakiura	77	6	25	3
punctid 1988:42 (MERaus)	1	1	1	1
punctid 1988:88 (MICimp)	12	2	-	-
punctid 1988:84 (MICmin)	-	-	1	1
punctid 1988:116 (PRSmay)	9	2	-	-
punctid 1988:114 (ROSglo)	3	1	2	1
punctid 1988:121 (RSPnel)	3	1	2	1
Phrixgnathus serratocostata	26	4	-	-
Phrixgnathus campbellicus	9	2	-	-
punctid 1988:181 (TAGpse)	10	2	-	-
Cavellia cf.colensoi	12	5	5	4
Cavellia cf.sylvia	5	1	4	2
Huonodon hectori	1	1	-	-
Ptychodon blacki	-	-	1	1
	223	41	72	20

295 specimens

WAIRAKI ISLAND, BREAKSEA SOUND: 1990

			p	
Phrixgnathus rakiura	390	7	91	6
Phrixgnathus stewartensis	-	-	2	1
	390	7	93	7

483 specimens

SPECIMENS COLLECTED:

	before 1990	1990	total
Breaksea Island	464	1611	2075
Entry Island	89	151	240
Gilbert No.1 I.	34	-	34
Outer Gilbert 3 I.	-	1366	1366
Hawea Island	529	116	645
Resolution I.N.shore	49	-	49
Wairaki Island	-	483	483
(Dusky Sound Is.)	295	-	295

REPRESENTATION BY FAMILY:

	B	E	G	O	H	R	W	D
Athoracophoridae	1					1		1
Charopidae	5	2	1		1	3		1
Flammulinidae	2	3	1		1			
Hydrobiidae	1							
Liareidae	3	1			1	3		
Punctidae	20	14	2	2	13	8	2	17
Rotadiscidae	12	5	1		4	2		4

For the Dusky Sound islands, 18 species were and 5 species were not found in Breaksea Sound. Thus 26 of the Breaksea Sound species were not found in Dusky Sound.

On Breaksea Island, 31 species were found before the 1990 trip, plus 13 species during the 1990 trip making a total of 44 species.
For Hawea Island, the corresponding figures were (15; 5; 20 total), and for Entry Island (12; 9; 21 total).

THE LAND SNAILS OF DUSKY AND BREAKSEA SOUNDS: data summary

Islands:

B=Breaksea Island	H=Hawea Island
E=Entry Island	R=Resolution Island
G=Gilbert Island No.1	W=Wairaki Island
O=Outer Gilbert Island No.3	D=Dusky Sound islands

SPECIES LIST:

(Specimens per island:)

	B	E	G	O	H	R	W	D
athoracophorid sp.	10	-	-	-	-	8	-	3
Phacussa costata	6	-	-	-	-	2	-	-
Phacussa henryi	120	6	1	-	12	1	-	2
Phenacharopa pseudanguicula	2	1	-	-	-	-	-	-
Thermia cressida	7	-	-	-	-	1	-	-
charopid "n.gen.3 n.sp.C"	2	-	-	-	-	-	-	-
Flammulina aff.lateaperta	7	-	-	-	-	-	-	-
Flammulina zebra	-	5	-	-	-	-	-	-
flammulinid pilsbryi?	-	6	-	-	-	-	-	-
flammulinid cf.pilsbryi	6	1	-	-	2	-	-	-
Potamopyrgus antipodarum	8	-	-	-	-	-	-	-
Cytora n.sp.cf.annectens	88	1	-	-	4	2	-	-
Cytora chiltoni	10	-	-	-	-	1	-	-
Cytora cf.pannosa	1	-	-	-	-	1	-	-
punctid 1988:203 (ARCrar)	7	-	-	-	-	-	-	-
punctid 1988:63 (AUSare)	-	-	-	-	-	-	-	19
punctid 1988:cf200(CYTnsp)	1	-	-	-	-	-	-	-
Phrixgnathus stewartensis	209	-	-	706	204	-	2	26
punctid 1988:113 (DORpar)	70	40	-	-	55	-	-	7
Phenacohelix subantarctica	8	6	-	-	-	-	-	-
punctid 1988:187 (HAZcry)	7	-	-	-	-	-	-	-
punctid 1988:214 (HESnot)	20	-	-	-	3	-	-	-
Paralaoma allochroida	104	22	-	-	65	-	-	8
punctid 1988:69 (IOTgrc)	1	-	-	-	-	-	-	2
punctid 1988:15 (KOKmat)	20	-	-	-	2	-	-	-
punctid 1988:14 (KOKmon)	-	-	-	-	-	-	-	12
punctid 1988:97 (LITord)	-	1	-	-	-	-	-	7
Phrixgnathus rakiura	599	2	27	660	10	1	481	102
punctid 1988:42 (MERaus)	58	30	2	-	182	6	-	2
punctid 1988:88 (MICimp)	38	6	-	-	4	1	-	12
punctid 1988:84 (MICmin)	10	9	-	-	2	-	-	1
Phrixgnathus celia	1	12	-	-	1	9	-	-
punctid 1988:116 (PRSmay)	49	2	-	-	-	-	-	9
Flammulina miserabilis	5	1	1	-	17	-	-	-
punctid 1988:114 (ROSglo)	75	1	-	-	16	6	-	5
punctid 1988:121 (RSPnel)	-	-	-	-	-	3	-	5
Phrixgnathus serratocostat.	-	3	-	-	-	-	-	26
Phrixgnathus campbellicus	49	11	-	-	15	5	-	9
punctid 1988:181 (TAGpse)	113	-	-	-	-	-	-	10
Allodiscus austrodimorphus	10	-	-	-	2	-	-	-
Allodiscus aff.planulatus	2	-	-	-	1	-	-	-
Allodiscus fectoloides	1	-	-	-	-	-	-	-
Allodiscus aff.turbotti	13	-	-	-	-	-	-	-
Cavellia cf.colensoi	114	-	-	-	54	-	-	17
Cavellia aff.sylvia	183	32	3	-	25	2	-	9
"Damonita" aff.eta	13	8	-	-	-	-	-	-
Huonodon gadus	4	27	-	-	-	-	-	-
Huonodon hectori	-	-	-	-	-	-	-	1
Paracharopa bianca	1	-	-	-	-	-	-	-
Phenacohelix cf.pilula	3	-	-	-	-	-	-	-
Ptychodon blacki	18	5	-	-	-	-	-	1
Mitodon wairarapa	1	1	-	-	-	2	-	-
totals	2075	240	34	1366	645	49	483	295

REPORT ON SNAIL COLLECTING TRIP, BREAKSEA SOUND, 18-26.4.1990

INTRODUCTION:

This report describes a field trip undertaken by Bruce Thomas (DSIR Land Resources Division, Nelson) and David Roscoe (Hon. Assoc. National Museum, Wellington) to conclude the assessment of the non-marine mollusc fauna of Breaksea Island and other outer Fiordland islands which has been undertaken aspart of the rat eradication programme in Breaksea Sound. This trip was jointly funded by the Department of Scientific and Industrial Research and the Department of Conservation. It is intended that a taxonomic paper will be written to describe all unnamed species encountered in this survey, followed by a general paper on distribution and ecology of all species.

AIMS:

1. A detailed survey of the distribution of non-marine molluscs on Breaksea I.

2. Increased coverage of other islands in Breaksea Sound, and species lists etc. for all islands in this study.

3. Extraction of other invertebrates to send to Mike Meads for curation.

4. Differential assessment of collecting techniques:
    a) mollusc specialist (D.Roscoe).
    b) biologist not specialising in molluscs (B.Thomas).
    c) non-biologists with field experience (DoC staff).

5. To obtain very fresh live-taken specimens to provide high-quality material for dissection in connection with taxonomic work.

6. To write two papers as outlined above.

REASONS FOR WORK DONE ON THIS FIELD TRIP:

1. To add to the baseline knowledge of the Breaksea fauna.

2. To assess any apparent changes from previous sampling results.

3. To begin to assess the uniqueness or otherwise of the Breaksea non-marine mollusc fauna (also the faunas of the other islands).

4. To achieve progress in developing the most efficient land mollusc sampling techniques for high-rainfall areas such as this with respect to:
    a) specialist sampling
    b) non-specialist (opportunistic) sampling
    c) equipment selection

5. To investigate the degree of uniformity in the distribution of land molluscs in these areas, so recommendations can be made regarding snail contributions to biomass determinations in high rainfall areas.

HISTORY:

Collection of leafmould samples for extraction of land molluscs in association with the rat eradication programme started with one sample in October 1987; by the start of this field trip, 36 samples had been fully assessed from Breaksea Island, 35 from Hawea Island and 30 from other islands in Breaksea Sound and Doubtful Sound. All but two samples contained snail shells. A grid was made showing how many specimens of each species were extracted from each sample.

From all these, 1415 specimens were collected, belonging to 36 species of which 26 are not yet officially named. The Breaksea Island total was 449 specimens from 29 species, 8 of which are known from a single specimen on this island.

Previous investigations of the land mollusc faunas of Fiordland and of Resolution Island by various workers are analysed in a preliminary account by D.Roscoe (Appendix B) which also includes an account of general and specific expectations from this field trip.

In the event, many expectations were proved wrong (see the details in square brackets in Appendix B).

METHODS:

Sampling: Non-specialist sampling was done by collecting 0.5-3 litres of loose material between decaying leaves (or other vegetation) and the underlying rock or other substrate, i.e. the cryptozoic layer. Specialist sampling was done by collecting the same layer,plus other places known to be productive if present, e.g. under decaying logs, in kiekie leaf bases, and around flax or anisotome bases; specimens seen in situ were sealed in small vials placed with the sample. In all cases a waterproof-paper label was marked with identifying details in pencil. Sorting: Material was washed with a steady stream of water through a large-mesh household sieve into a container.

Material which passed through the sieve and floated was then washed in a coffee sieve to remove small particles. This method removes mud and bubbles (from saponins in the leaf litter) so specimens can be easily seen. Specimen are picked off the surface while floating, using a mapping pen; this include mostly empty shells, in the 1-5mm. diameter range commonest in this country. Live animals and slugs are sorted from the particles which sink in water, on a plate with water to cover the debris.

Litter samples which could not be sorted on the island were left in tied plastic bags and stored in a refrigerator in the Nelson offices of the Land Resources Division of the D.S.I.R. until processed. Non-mollusc invertebrate were placed directly in alcohol; a cottonwool plug was inserted and a plasti cap used to seal the vial.

Curation: Empty shells are dried thoroughly on small circles cut from paper towels, or in trays folded from the same material (dried shells may adhere t toilet paper etc. and be broken when removal is attempted).

Live animals were transferred to cold water from the hot tap (i.e. boiled remove oxygen) and stored for about 12 hours in 2 ml. plastic screw-capped vials, then the water was replaced with alcohol (to 70%). Cottonwool plugs were inserted (in case stoppers fell out or shattered the top of the vial) a plastic plugs forced in to seal the vials.

Tiny labels in pencil on all-weather paper remain with all specimens until eventual sorting to species level;then computer-generated labels are prepare photo-reduced for archival permanency, and the specimens sent to the Nationa Museum in stoppered 5 cm. glass vials provided by the Museum. This preparati method ensures that dry shells do not suffer deterioration from "museum disease", where circulation of small amounts of moisture transports calcium carbonate to the outside of the shell, collapsing it; and live-taken specime die rapidly (from anoxia) in the extended position (from osmotic effects).

All final labels include series 260 metric map references and bait-station data, with collector/date/island/vegetation data also.

RESULTS.

3772 specimens from 96 locality lots were collected on this trip, bringing th overall total to 5187 specimens from 197 locality lots. All specimens have been tentatively identified, many checked by Dr.F. Climo, and all are now being cross-checked against others labelled similarly; some details of the statistics presented here will change before the formal papers are written.

Fifty-two species are currently listed from the whole survey, including sixte first seen on this trip.

		specimens	species	species of 1 locality	species of 1 specimen	locality lots
Breaksea I.	to 1989	457	29	9	8	36
	to 1990	2075	44	16	7	112
Entry I.	to 1989	89	15	10	6	3
	to 1990	240	25	14	7	6
Hawea I.	to 1989	503	15	3	1	35
	to 1990	645	20	8	2	43
Other Is.	to 1989	455	27	5	3	27
	to 1990	2227	31	13	7	36
total	to 1989	1415	36	-	-	101
	to 1990	5187	52	-	-	197

(TABLE 1)

In the island categories Breaksea/Hawea/Entry/others, the number of known species increased substantially (50+% for Breaksea Island). Detailed consideration of the one specimen/species and one locality/species data sugges interesting conclusions: Only on BreakseaI. has the number of species known fr one specimen actually decreased; the Breaksea Island species list must be near complete. The one locality/species figure has increased for all these island categories. Taking these findings together it is now clear that a full range o habitats must be sampled before the non-marine mollusc fauna of areas such as these can be considered well-known, as commonsense would suggest. Entry Island was particularly interesting, as the three sites sampled (mollusc specialist) this trip were precisely the same as the three sites sampled (trained biologis previously. The 67% increase in the species list underlines the need for full habitat sampling. All sites were a few metres at most from the sea, and since many interesting sites (e.g. the Nothofagus stands) remain to be sampled on Entry Island, probably many more species will eventually be found there.

RECOMMENDATIONS:

1. None of the land molluscs on Breaksea Island was particularly large in size except the Athoracophorid slug which appears to be photophobic and to hide by day in kiekie or flax leaf-bases; the largest snails are Thermia cressida, which has a globular shell and was found to be strictly arboreal on beech trees, and Phelussa henryi, which has a flattened shell and can retreat to narrow crevices under stones. All these can therefore escape rat predation to some extent.
   If Powelliphanta fiordlandica, which occurs on Resolution Island, had occurred on the adjacent Breaksea Island, it would have been predated to local extinction by the rats. Translocation to Breaksea Island would probably be successful if indicated.
2. Re-collection of known sites might provide information an the effects, if any, of any concentration of Talon residues in invertebrates.
3. Continued monitoring at intervals may be advisable if some species appear to be much more common or rare than in earlier surveys when some rats were still present on the island. As a preliminary observation, Phelussa henryi appears to be now very common alive, as do some of the insects (spiders, wetas). Some species may be present but too rare to have been collected to date; continued monitoring could possibly be very interesting in such cases. If some invertebrates are increasing at the expense of others, this could be taken into account when considering whether to transfer endangered species of animals to Breaksea Island.
4. A habitat checklist should be urgently prepared by land mollusc specialists with spare copies kept in departmental offices whose staff or volunteers are likely to collect leafmould samples for analysis.

ACKNOWLEDGEMENTS:

We are grateful to the D.S.I.R. Land Resources Division for providing air fares to Invercargill and the assistance of Bruce Thomas in field work and sorting; to the Department of Conservation for providing transport to and from the island (vehicle/boat/helicopter) and all meals while on Breaksea Island, as well as friendly company and the use of all facilities on the island; and not least to the Peacock family in Te Anau for providing food, accommodation and much interesting discussion.

APPENDIX A.

FIELD TRIP DIARY:

18.4.90 Arrival at Breaksea Island in the evening.

19.4.90 Familiarisation climb and collecting on Northeast Ridge and the 120m level, including simultaneous collection of two sites by D.Roscoe and B.Thomas, with concurrent sampling of various selected trap sites by Department of Conservation staff while bait stations and track markers for horizontal tracks were being removed. This latter sampling continued from further sites on subsequent days. The Exit Track stream was searched for freshwater molluscs; specimens of one species were found under stones at 135m. Other streams on Hawea and Breaksea Islands were subsequently checked without finding more specimens or species.

20.4.90 Extraction of specimens from material collected on the previous day.

21.4.90 Further extraction of specimens, then tramping to the SW bivouac. Vegetation was observed at night with battery-powered headlights.

22.4.90 Sampling of sites on the adjacent West & SW beaches and return to base hut in the evening.

23.4.90 Further extraction of specimens from collected samples.

24.4.90 Sampling of Nothofagus sites at the top of the island (D.Roscoe) and at sites off the SE ridge (B.Thomas).

25.4.90 Collection of samples from areas on Entry Island (D.Roscoe), Outer Gilbert No.3 Island (B.Thomas) and Hawea and Wairaki Islands (D.Roscoe and B.Thomas) with transport by the Renown, and observation of freshwater on Hawea Island (no molluscs found), and investigation of high-tide-mark kelp holdfasts and driftwood near the base camp (on The Neck). More night-searching with headlights was done; snails and slugs were collected and photographs taken of a weta.

26.4.90 Return to Te Anau in the morning.

APPENDIX B

Preliminary notes: the state of knowledge of the land molluscs of western Fiordland at 16.4.1990, and expectations for survey 18-27.4.1990.

PREVIOUS SURVEYS:
Dell's 1954 listing of the land molluscs of Fiordland (1) included the previous records plus his own sampling in Caswell Sound. He listed 33 "species" though four of the species and subspecies listed would now be considered to be part of the variation of Ptychodon fiordlandica. Of the 30 species, then, 26 were recorded from western Fiordland. In 1975, Norm. Gardner and Jim Goulstone, both experienced expert volunteer students of land molluscs, visited Resolution Island and produced a report (2) based on 1304 specimens from six locality lots (although over half, 772, were listed as the rotadiscid Huonodon hectori). A subsequent report (3) which they prepared listed land molluscs from eastern Fiordland areas. These reports were photocopied and privately circulated in printed covers; they were well illustrated (one species per page, three large illustrations of most species) and included notes on ecology, distribution and significance of the findings.

	1954		1975		1990	
Athoracophoridae	0		1		1	
Charopidae	5		3		3	
Flammulinidae	4		1		1	
Liareidae	2		2		1	
Otoconchidae	1		0		0	
Punctidae	5	19%	7	26%	21	58%
Rhytididae	0		1		0	
Rotadiscidae	9	35%	13	48%	9	25%
total	26		28		36	
locality lots	-		6		101	
specimens	-		1304		1415	

TABLE 1 Representation of non-marine mollusc families in the surveys

THE CURRENT SURVEY:
This has so far assessed 1415 specimens from 101 locality lots in Breaksea, Hawea and various other islands in the area. Summaries of species found in these surveys are listed in table 1 above.
The species encountered included 14 common to the 1954 survey and 14 common to the 1975 survey, thus with 22 not represented in each of the earlier surveys. Also the numbers of species from each of the two families commonest throughout New Zealand, Punctidae and Rotadiscidae, vary oddly, with many more rotadiscid than punctid species in the earlier surveys, and vice versa in the current survey. In the case of the 1975 expedition this may have reflected an emphasis on collecting under logs, where rotadiscids are most often found, whereas the current survey has often sampled leaf litter where punctids usually tend to be more abundant. However there is an observed tendency for punctids to be a significant feature of southern island faunas, as opposed to the mainland.

	specimens	spp.	/1 loc	/1spec /1loc	loc.lots
Breaksea I.	457	29	9	8	36
Hawea I.	503	15	3	1	35
Other Is.	455	27	5	3	30
total	1415	36	-	-	101

TABLE 2. Specimens and species so far in the current survey.

The above table shows how many specimens and species were collected from Breaksea, Hawea and (various nearby) islands, also how many species observed in this survey were not found in each case. Also the number of species known from a single collecting lot, and those from a single specimen only, are listed for each case.
It can be seen that rather a large number of species are known from only one specimen or one locality; this indicates either a relict fauna or inadequate collecting, and probably the latter because the localities involved are widespread over Breaksea Island in particular; the most familiar pattern in such cases is that more extensive sampling would produce more specimens and localities for those, but show unexpected species, previously not found, but similarly "rare".
It will be interesting to get some idea of the extent of the nature of population dynamics, and whether population explosions are much in evidence, and seasonal or apparently random. Details of such matters become clearer in repeated sampling of the same areas.

EXPECTATIONS

1989 expectations:	1990 findings:
I expect the following:	
This (April 1990) effort should produce more than 1000 specimens from more than 30 locality lots	3772 specimens. 96 locality lots.
and should substantially reduce the amount of "only one locality" or "only one specimen" records on any island sampled.	Increased in nearly all cases.
I will be surprised if the Breaksea I. total of species ends up at above 31 or 32,	44 species were listed.
but would expect to collect all of the previously known species,	In fact, we missed 5 species on Breaksea I.,5 on Hawea I. and 6 on Entry I.; these figures may be reduced when the earlier specimens are rechecked.
and to be able to collect in areas previously uncollected.	Yes, more complete coverage of Breaksea and Hawea Is. and first sampling of Outer Gilbert 3 and Wairaki Islands.
The previous samples for this survey, each of about 0.5-3 litres, have produced an average of 14 specimens per locality lot; I would expect to see a higher average this time , [39], and more species per sample.	The average was 39 specimens per lot. Less species per sample on Breaksea I. (4.6 to 1989, 3.2 in 1990), more in Entry (1988,6.7; 1990,9.3) and Hawea (1988,2.4; 1990,4.8). "Others" were 2.8 species overall.
I would expect to see the punctid/ rotadiscid species ratio reduce, i.e. less punctids per rotadiscid, but not by much.	From 2.33 down to 1.93.
I would not expect to see "Maoriconcha" fiordlandica this time,	Not seen.
nor the larger flammulinids mentioned by Dell,	Flammulina zebra recorded (Entry I.)
as they are probably restricted to mainland bush, but expect to obtain at least one or two adult athoracophorid slugs of at least one species and probably two,	Only one athoracophorid species seen.
and to carry them back in good condition.	These did not preserve very well; according to a talk given on this family by D. Burton at a subsequent land mollusc workshop in Wellington, adequate preservation for taxonomic assessment may not be practicable in our present state of knowledge.
I do not expect to see Powelliphanta fiordlandica on any island smaller than Resolution, or in any place apart from the type locality; I do not expect to find any other members of the family Rhytididae ("Rhytida" otagoensis, or the coloured Powelliphantas apparently seen in the Fiordland Sounds), nor the giant athoracophorid slug seen at high altitudes in coastal Fiordland.	None of these various species was seen.
I do not expect to find any freshwater or brackish-water molluscs, as I am sure these would have been spotted very early on if present;	One species was found on Breaksea Id.
introduced land molluscs would also surely have been seen previously.	Not seen this trip.

(EXPECTATIONS)

(1989 expectations:)

It would be gratifying to find previously unrecorded or unknown species in the area, but considering the large number of localities so far sampled in all of the above surveys, this would seem unlikely .

(1990 findings:)

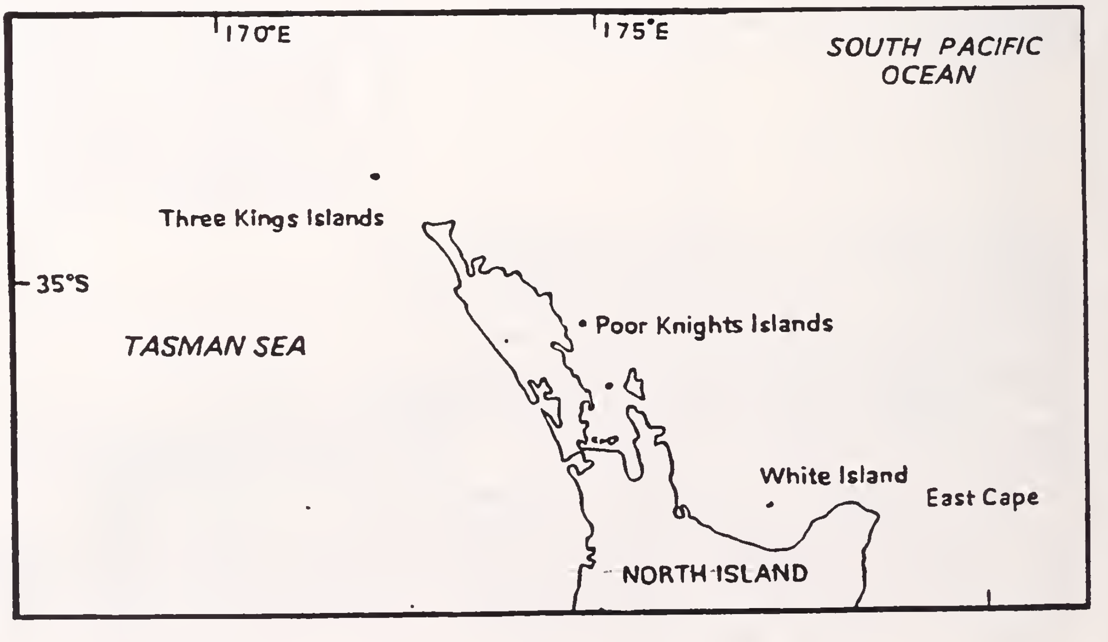
Wider habitat sampling on this trip produced more records of known species, some only recently discover from other areas of Fiordland. Unkno species are expected to exist in largely unsampled Fiordland habitats (such as limestone and alpine areas)

REFERENCES:

1) The Land Mollusca of Fiordland, South-West Otago. R.K.Dell. T.R.S.N.Z. 82(5) pp1135-1148, 1954

(2) N.Z. Landsnail Fauna Vol.1. A Report on the Native Landsnails of Resolution Island, Fiordland, New Zealand. J.F.Goulstone & N.Gardner, 1975. 32 pp.

(3) N.Z. Landsnail Fauna Vol.3. A Report on Native Land Snails in Several Areas within the Fiordland National Park. J.F.Goulstone & N.Gardner, 1976.



Phenacovolva longirostrata Vs Phenacovolva wakayamaensis.

Mistaken Identity ?

A single ovulid species is known from the Poor Knights Islands off the east coast of Northland, New Zealand.

Until recently, its identity has been accepted as Phenacovolva longirostrata Sowerby, 1828 and its Pacific range extending from Japan, through the Philippine Is., Thailand and down to northern New Zealand. Indian Ocean recordings include Western Australia and the south west coast of the Republic of South Africa. The type locality is Mauritius.

The local species is a rare shell, found on its host gorgonian (Primnoides sp.) in deep water at approx. 150ft. In New Zealand it appears to be restricted to the Poor Knight group of islands - see Map. William Liltved in his rather spectacular recent book "Cowries and their relatives of Southern Africa" discusses P. longirostrata in detail due to its occurrence off the Natal Coast of South Africa. In it he discusses the New Zealand ovulid as Phenacovolva wakayamaensis Cate & Azuma, 1973 and distinguishes it from P. longirostrata by the following shell characteristics -

	P. wakayamaensis	P. longirostrata
Terminals	Longitudinally aligned Not striate	Recurved Transversely striate
Body whorl	Elongated, thin and not medially humped	Shorter, thicker and medially humped
Labrum	Slender, rod-like	Ventrally flattened and swollen centrally

The external appearances of both animals are available for comparison and are obviously quite different - see photos of the living animal.
The background mantle colour of P. wakayamaensis is white with multiple golden coloured, irregular spots scattered throughout the mantle surface. These spots have dark, well defined peripheral margins and paler centres. There are multiple, slightly elevated small white papillae interspersed between the spots. In contrast, P. longirostrata's background colour is gold/tan with multiple target lesions of varying size scattered throughout the mantle surface. These targets have a white periphery and centre separated by a well defined brown ring. There are small papillae arising from within the targets (not well seen on photo). The photo of the living animal of P. wakayamaensis on its host gorgonian was taken by Jurgen Rotzel at 180 - 190ft off the Poor Knights Islands, New Zealand. The photo of P. longirostrata was taken by William Liltved of Cape Town and the shell was found crawling freely over gorgonian covered high profile reef at 150ft off the Natal Coast, Republic of South Africa. My sincere thanks go to these two gentlemen for allowing me to reproduce their respective photographs.

The local shell does appear to be P. wakayamaensis and its known distribution outside New Zealand appears to be confined to Japanese waters.

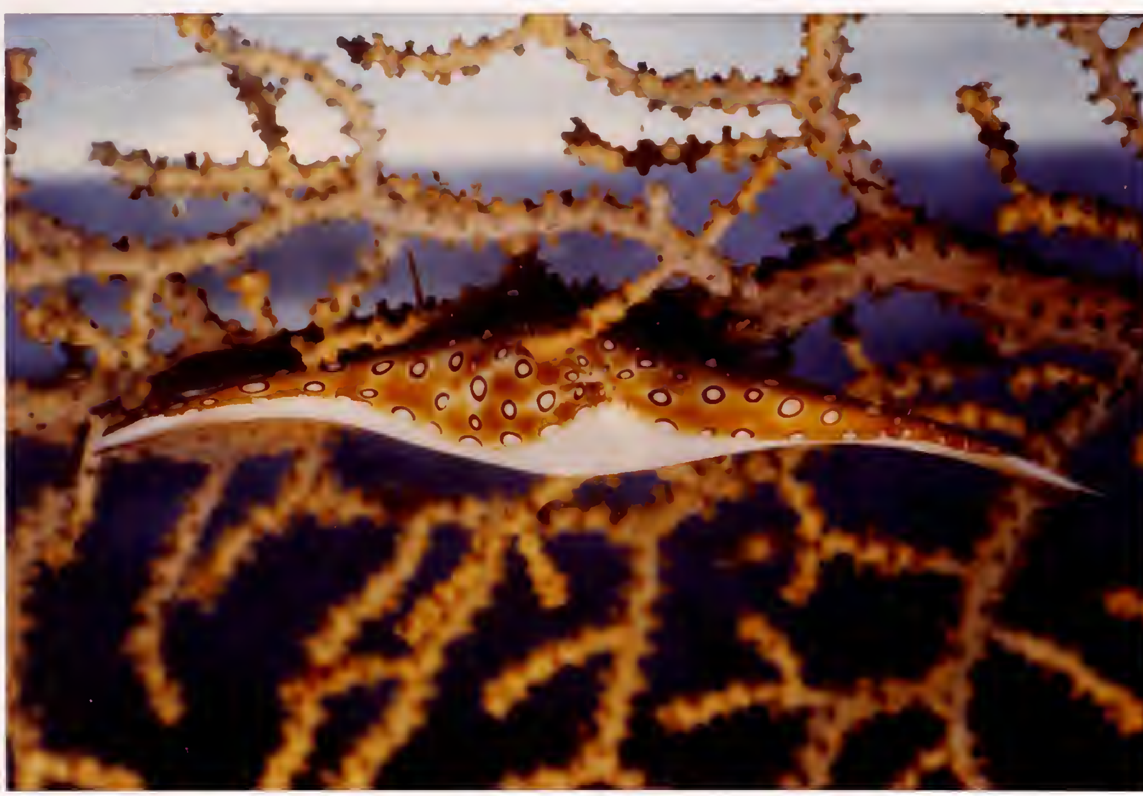
If any local collector/diver has any further information regarding the local distribution of P. wakayamaensis, it would be much appreciated.

Literature cited -

New Zealand Mollusca A.W.B. Powell page 152

Cowries and their relatives of Southern Africa. W.R. Liltved page 135/36.

Phenacovolva wakayamaensis (New Zealand)

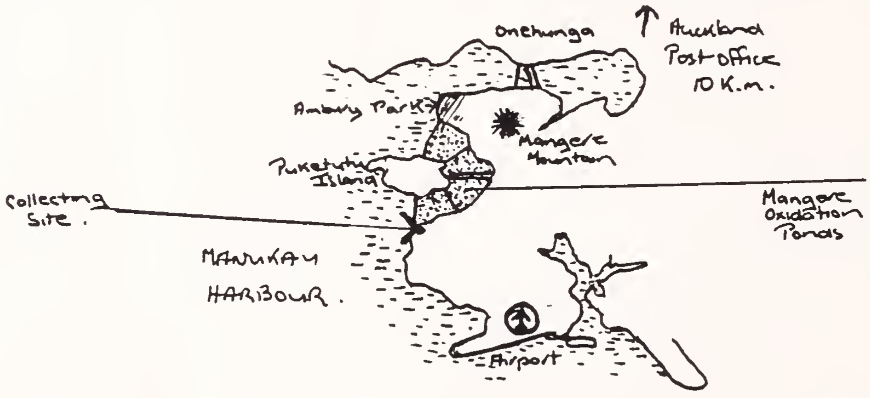


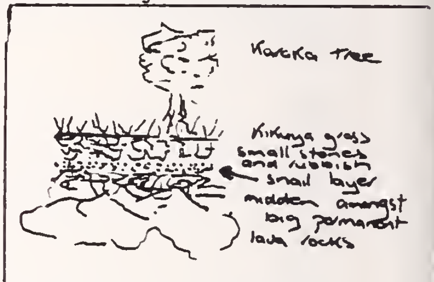
Phenacovolva longirostrata (Republic of South Africa)

POIRIERIA NOTES OF INTEREST. J.F.Goulstone

The Forest and Bird Society has an extensive Reserve at Bethels, in the Waitakere Ranges, called Matuku. The feature of the Reserve is the observation platform high up in a Puriri Tree, which is used for a variety of projects, and on the day I was there was being used for trapping insects. I collected a certain amount of very fine litter from the platform and from branches and the trunk which were accessible from it. When I subsequently looked at it a surprising number of snails appeared. From just ¼litre of fine debris I collected:- 25 **Huonodon hectori**, 3 **Flammulina perdita**, 1 **Phenacharopa pseudanguicula** 1 **Mocella eta**, 1 **Allodiscus planulatus**, 3 **Phrixgnathus ariel**, 2 **Phrixgnathus moellendorffi**, 1 **Phrixgnathus glabriusculus**,2 **Punctid n.sp. 17.** These were all more than 10 metres off the ground.

Ray Clough, an honorary Ranger at Ambury Regional Park, recently told me of an old midden which had been partly dug up in a very rocky corner of the Mangere Oxidation Ponds. He thought there could be fossil snails in the deposits, and so it turned out. In fact there was





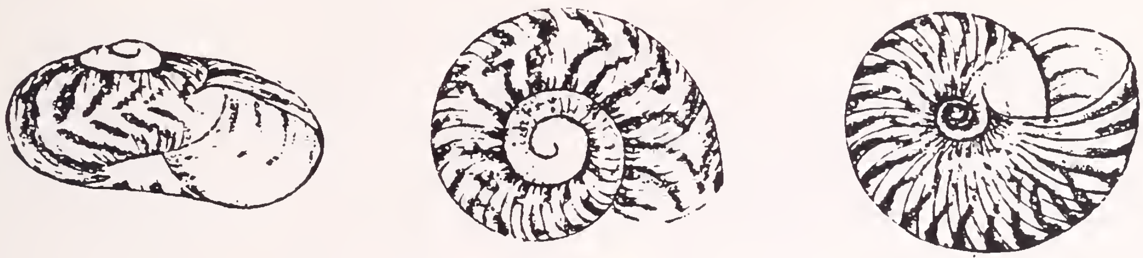
PROFILE OF MIDDEN.

a rich layer of well preserved semi-fossil land snailsoverlaying the midden and neatly exposed in cross section by the A.R.C. digger. Here is a list.
Cochlicopa lubrica, Oxychilus cellarius, Vallonia excentrica,Phrixgnathus cf ariel. These were present above ground in the kikuya grass and particularly under a nearby karaka tree. They were living snails which had dropped into the fossil deposits, there were none actually in the deposit. Paralaoma caputspinulae 7, Tornatellinops novoseelandica 8, Tornatellides subperforata 7, were present in the deposit but were actually living under muhlenbeckia in huge numbers several hundred metres away. Omphalorissa purchasi 2, Thalassohelix ziczag 7, Delos coresia 44, "Mocella" sp. 4 45, Egestula egesta 31, Mocella eta 15, Flammulina chiron 2, Phrixgnathus fulguratus 7, Phenacohelix giveni 10, Fectola infecta (could be a few mira) 49, Punctid n.sp. 38 6, "Mocella" sp. 3 26, Laoma cf marina 16, Cavellia buccinella 5.

This was from about 2 litres of material and represented snails from a very diverse community which once lived on the site. The Egestula in such numbers was a surprise because it is not common now around Auckland and doesn't extend any further south. It does like rocky ground however, and this site was very rocky!

An addition to the South Auckland Landsnail Report.

Flammulina cf crebriflammis 4.8mm. x 2.4mm. Workmans Track, Hunua Ranges, (between Mt. Workman and Whakatiwai.) This has ribs similar to **F. chiron and I believe** has been seen in the Waikato (B.F.Hazelwood). I found it under bark on a fallen Tawa, but could only find one. 23/1/91



An addition to the Waitakere Landsnail Report.

Laoma domed poecilosticta 3mm. x 2mm. Karekare coll. B.F.Hazelwood, 8/91. I did in fact draw one at the bottom of page 34 of that report but failed to recognise it as a distinct species as I only had the one. Quite a colony was found at Karekare. It is more common in the Waikato and Bay of Plenty and has weaker ribs and a more domed outline than **L.poecilosticta.**

Extension of the range for *Zeacumantus subcarinatus*

by Margaret Morley

In "New Zealand Mollusca" Dr Powell gives the range for *Zeacumantus subcarinatus* (Sowerby, 1985) as North Island, the northern part of the South Island and the Chathams. On 2/3/90 I was searching a shell dump below an oyster factory (*Tiostrea chilensis lutaria* (Hutton, 1873)) in Bluff Harbour, Southland. It was, alas, too old to provide any good specimens of *Chlamys* species, but there was a thriving colony of *Zeacumantus subcarinatus* on the mud covered oyster shells at high tide.

Collecting up North

Fiona Thompson

At the beginning of May we had a fortnight at Te Ngaere, during which we had two good storms. The first of these obviously stirred the seaweed condiderably, although it didn't uproot it; and over the following four or five days the small pink sea egg, *Pseudochinus*, were washed up. Over fifty of them were seen with their spines ranging in colour from purple through red and pink to olive. *Tanea* and *Turbo granosa* were also found.

The rocky area of Te Ngaere itself has changed considerably in the past few years. The pools which previously hosted a diversity of molluscs such as *Marginella mustelina* and *Morula chaidea* have had successive layers of small stones dumped on them and are no longer so productive. However, in compensation, a wonderful variety of chitons in many colours and patterns are plentiful. I did find a pair of *Zemyllita stowei*, and *Cardita brookesi* is flourishing with plenty of juveniles but few adults.

Collecting on Step Island in the Cavalli's was somewhat limited since it was full tide and just prior to the second storm. Nevertheless, it produced some good *Cantharidus opalis*, many pairs of small to medium *Glycymeris laticostata* and a few *Bulla vernicosa*, *Nassarius spiratus*, *Trichosirius*, *Monoplex*, *Mayena*, a single *Cymatium* (*Turritriton*) *exaratum*, and a good sized pair of *Scalpomactra* - not to mention the decapitated skeleton of a sea dragon. A couple of dredges in the channel gave *Myadora subrostrata*, lots of *Xymene ambiguus*, and some beautifully marked *Cominella quoyana*.

After the second storm we made two brief trips to Matauri Bay before returning home. We found a good number of freshly dead *Marginella pygmaea* in lovely yellows and near orange colours, five *Trivia merces*, two *Philippea lutea*, *Cantharidis opalis*, many pairs of *Glycymeris modesta*, *Haliotis iris* and *Haliotis virginea*, *Duplicaria tristis* and *Duplicaria flexicostata*, *Epitonium bucknilli*, and *Cirsotrema zelebori*.

However, the highlight for me were the hermit crabbed *Amalda*. These were plentiful, mostly *australis*, with the colours ranging from the normal dark brown to blurred colouring on the top to bluff colouring. But four of them were pure sparkling white with a denser white band and at the tip of each a dot of bright yellow. Lastly, two were bright yellow with stronger yellow-gold bands. The identity of these last specimens remains a mystery.

The Blue-Ringed Chiton - *Chiton sinclairi* 1843

by Bruce Hazelwood (Illustrations by M Morley)

It has been generally accepted that Boyle 1970, synonymised *Chiton sinclairi* Gray 1843 with *Chiton pelliserpentis* Qouy & Gaimard 1835. In fact Boyle only accepted Johns 1960 unpublished thesis results without presenting or questioning the evidence. He offered no additional information to substantiate this action. Both "species" inhabit the same rocks at low tide, and juveniles of each can be found together. Different sculpture, however, separates the two. C.*sinclairi* can be identified by eye when one knows what to look for; the smooth sculpture, smooth shining girdle scales, blackish colouring streaked with white, and the blue girdle elements distinguish this form. It is at its best on low tidal rocky platforms and on large boulders covered in seaweed in surf-beaten situations (pink coral zone). It also inhabits low tidal rocks in more sheltered areas. Specimens are usually badly eroded, although identification can be confirmed by the above features as a small band of sculpture can be detected where the valves overlap. My observations are based on my own collection, mainly from the North Island, New Zealand.

C.*pelliserpentis* does not usually display blue or green pigmentation of the girdle scales - they are dull in appearance. The sculpture of there valves is filled with crinkles, whereas those of *sinclairi* are smooth and glossy. There is some variation in *sinclairi* sculpture, shape and girdle scale sculpture. Girdle colours include black, blue, green and gold. In *pelliserpentis* girdle colouration consists of varying shades of brown and grey.

I have noted a degree of hybridization in some individuals. Both "species" are reported to be broadcast spawners (e.g. Johns 1960) suggesting uniformity from place to place.

Sculpture, shape and size of these two "species" varies due to its station and genetic morphological type it displays. C.*pelliserpentis* prefers a mid tidal station; and it is here that old eroded specimens congregate. Younger specimens are found at the low tidal mark (Morton & Miller 1968). C.*pelliserpentis* grows to a much larger size when compared with *sinclairi*.

Good clean large specimens of *sinclairi* show a totally different set of characters to *pelliserpentis*; and are in fact very similar to the genus Rhyssoplax. They may be morphs of the same species, but in most situations appear to act as separate "species". I feel more information is needed on reproduction, feeding preferences, and life history to determine this. Publication of Johns thesis results would also help.

According to Powell, _sinclairi_ is distributed around all three main islands of New Zealand but is not found at the Chathams. In listing chiton locality data, the _sinclairi_ form should be mentioned as its omission limits knowledge of chiton ecology. Bimorphism of _pelliserpentis_ needs to be studied in more detail. Absence of one of these two "forms" regionally is noteworthy and would need to be explained. It is still possible that both are valid species! The observed hybridization may only be the mixing of similar genetic material due to simultaneous broadcast spawning. In this regard they may be infertile offspring in the same way that mules are the infertile offspring of horses bred with donkeys.

More detailed study is required of _Chiton_ _pelliserpentis_ - New Zealand's commonest intertidal chiton.

Note: In describing _Chiton_ _aorangi_ Creese & O'Neil 1987 have shown that _aorangi_ broods its young, and becomes sexually active at a much smaller size than _pelliserpentis_ from the same locality. I do not know if the _sinclairi_ "form" is found at _aorangi_ sites, although Bob Creese has told me that he has not seen it at the Mokohinau Islands. _Chiton_ _aorangi_ sites are Poor Knights Islands, N E Island (Three Kings Islands), Alderman Islands, and Mokohinau Islands. The above authors do not recognise the _sinclairi_ form in their paper.

Note: I have either collected or verified specimens of "_sinclairi_" from the following localities: Kaikoura, Mount Maunganui, Paekakariki, Raglan, Waipu Cove, Makara & Lyall Bay(Wellington), Waihi, Takapuna-Mellons Bay-Mechanics Bay-Kohimarama-Ladys Bay-Kendalls Bay (Auckland), Pukerua Bay, Whangarei Harbour, Mahia, Nelson, Mahunga Beach(Mahia), Ohope, Okui & Kuaotuna(Coromandel), Scott Point(90 Mile Beach), Tolaga Bay, and Ti Point.

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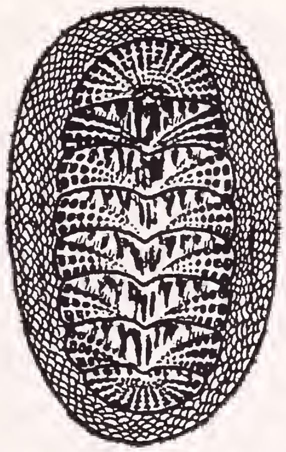
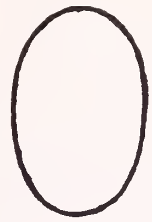
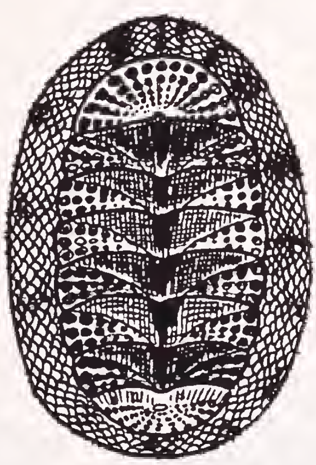
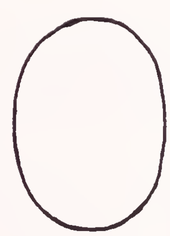




Chiton sinclairi
Waipu Cove, Northland
low tide

actual size





Chiton pelliserpentis
Lady's Bay, Saint Helliers
AUCKLAND low tide

actual size

Lodderia eumorpha eumorpha (Suter 1908)

by Margaret Morley

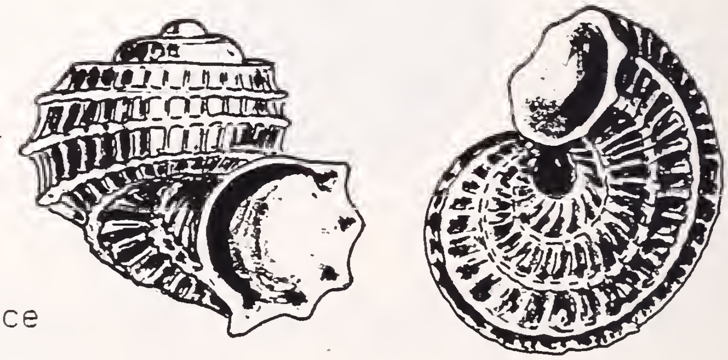
This is number four in the series "Visible Evidence"; that is species not illustrated in "New Zealand Mollusca" by Powell. *Lodderia eumorpha eumorpha* is in the family Cyclostrematidae. The specimen shown was dredged from Foveaux Strait and is in the Auckland Museum collection. The type specimen was dredged in 50 fathoms off the Snares Islands. Captain Bollons also obtained specimens off the Auckland Islands in 85 and 95 fathoms. Although only 0.9mm in height it is a most attractive shell under the microscope.

The following are the main points of Suter's description: "shell very small, turbinate...sculpture consisting of five prominent spiral riblets, the first just above the periphery ...radiate sculpture formed by distinct threads which are equidistant...the interstices wider than the threads...colour white...protoconch minute, sperical of one whorl..., base convex...suture impressed...aperture oblique, circular...periostome continuous, smooth inside, ornamented outside by the spiral sculpture...columella arcuate, strong, not reflexed...umbilicus rather narrow, deep...operculum not seen. Height 1.3mm, diameter 1.7mm." The operculum in the museum's specimen is circular, pale ochre yellow, with a few concentric flattened ridges on the external surface.

Thanks to Dr B Hayward for the loan of the specimen for drawing purposes.

Reference:

Suter's Manuel Page 153, and Suter's Atlas of Plates Plate 33 (as *Cyclostrema eumorpha*)



Lodderia eumorpha eumorpha
(Suter 1908)
Dredged Foveaux Strait
Height 0.9mm
Diameter 1.2mm

Operculum - external surface

Cleaning and Restoring Shells

Margaret Morley

Before delving into the many and varied ways of cleaning shells I pose two questions:

Do you "need" live taken shells?

If you have convinced yourself that the answer is "yes" then

Should shells be cleaned?

Recent trends emphasise the importance of malacology rather than conchology. That gem specimen in your collection may be useless to scientists because the animal's body parts with their unique DNA have been flushed down the plug hole!

However, let us assume you have decided to take live specimens. Consider the **least** number that will suffice. Remember, the more you collect the more they smell! Leave damaged or immature shells behind to breed. While collecting and throughout the cleaning process, record full details with each shell. To quote Goldsmith: "Memory is a fond deceiver." Beware of using a ball point pen - it won't write in the rain, and totally disappears if put in contact with methylated spirits! Some collectors use a pencil in the field. At the cleaning stage I prefer a waterproof garden pen. This survives all treatments - provided the label doesn't disintegrate.

METHODS:

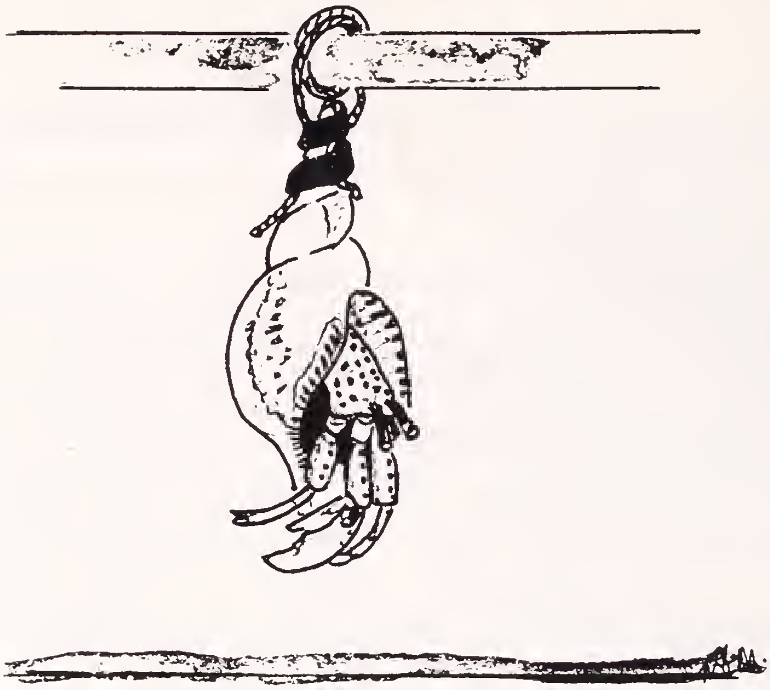
Dead Shells:

If the shell is dead, just soak for one hour in fresh water, then wash gently if fragile; or scrub with an old toothbrush. A soak in dilute Janola may bring up the original colour. Rinse well and dry thoroughly.

Hermit Crabbed Shells:

You may need to know which hermits respond to which method! Some Brisbane crabs will shake out. Tropical land hermits will hop out of the shell if you whistle into the aperture (if you have the knack!). A lighted cigarette applied to the shell spire often also works. Less dramatically, try leaving them sealed dry in a plastic bag somewhere warm - they die extended from the shell. The whole body can then be removed with tweezers. A steady pull while rotating the shell is most likely to be successful. A large shell, eg *Charonia*, can be suspended upsidedown over night, and the hermit crab will fall out.

TAPE STRING ONTO SPIRE + SUSPEND SHELL UPSIDEDOWN



Bivalves:

Strong shells can be frozen and will gape. Soak more fragile shells in fresh water. When the valves gape the body can be flushed out - eg Offadesma angasi. The attachment of the adductor muscles often needs a scrape. Close the valves and secure while drying with a strip of paper towel and a turn of masking tape. Beware the use of rubber bands or twisties; as if forgotten these can permanently stain or damage the shell. If a bivalve drys open, try immersing the hinge in hot water and detergent - this relaxes the ligament and the valves may then be closed.....carefully! When clean and dry treat the hinge with the chiton preservative - 50% glycerine, 50% isopropyl alcohol. It penetrates easily, keeps the ligament supple, and does not go mouldy.

Live Univalves:

(A) Under 10mm:

If you wish to prevent the animal and operculum withdrawing out of sight, allow the animal to become groggy in air overnight or wait until it does not respond briskly to prodding. Then immerse in 70% meths (do not use formaldehyde or pure alcohol) for one to two weeks according to size. Using 100% meths dries out the animal too much for use in dissection work. The purple dye in meths may stain shells. Occasionally you may spot a very pale bottle of meths in the supermarket, or you can buy clear meths from a chemist. When caught without meths, surgical spirit or spirit drinks such as gin make temporary substitutes. Microscopic shells should be washed in fresh water, then immersed in 50% buffered ethanol followed by thorough drying.

(B) Live Univalves over 10mm: The troubles begin!!

(a) Bury in the garden:

Not recommended in New Zealand. In the tropics especially, protection is needed against rats and pigs. Ants do the job, but not quickly enough for holidaymakers. Norman Douglas used to put his shells in a sealed box at the far end of the garden and wait for several weeks until they rotted. They were then hosed out etc - a possible method if you are patient, but it is easy to forget them! Also, the rotting animal may damage the shell.

(b) Boiling:

Do not boil shiny shells like cowries because the surface may craze; and avoid this method for precious shells. Boiling can be used as a quick method with species such as *Penion* and *Struthiolaria*. Cover the shells with cold water, slowly bring to the boil, simmer for up to ten minutes (depending on size), then cool until you can handle them. As for hermits, grip the animal with tweezers or dental tool, maintain a steady pull, and rotate the shell as you feel the animal "give". Then rinse and dry.

(c) Throw at sand:

In Aitutake in the Cook Islands I was shown their method of cleaning cowries. My prize *Cypraea tigris* was forcefully and repeatedly thrown at a pile of sand. Within a minute the body had liquidised and just ran out. There was no shell damage! This is not a good method for the faint hearted!

(d) Soak in old engine oil:

After three days of this treatment the body can be hosed out. Despite reassurances, the doubters wondered if this would cause staining of the shells. Shells can also be soaked in oil - eg baby oil - to lessen encrustations.

(e) Microwave:

For best results start with live shells, but it also works for frozen specimens. It is not suitable for small shells. Disasters like exploding shells have been reported, so proceed with care. Put the shell on a paper plate and cover with a paper towel; or put inside a bag. The animal comes out with an audible pop. Suggested times on medium power are:

small - 50 seconds
medium - 50 seconds to 1.5 minutes
large - 1.5 to 6 minutes (check every 2 minutes)

(f) Deep freeze:

Do not freeze fragile shells as they may crack. Freezing is useful for temporary storage if you are busy. Shells can be brought out in managable lots at a later date. Also, freezing facilitates removal of the animal. If not all the body is removed the first time the shell can be refrozen and the process repeated until the shell is clean.

(g) Ordinary fridge:

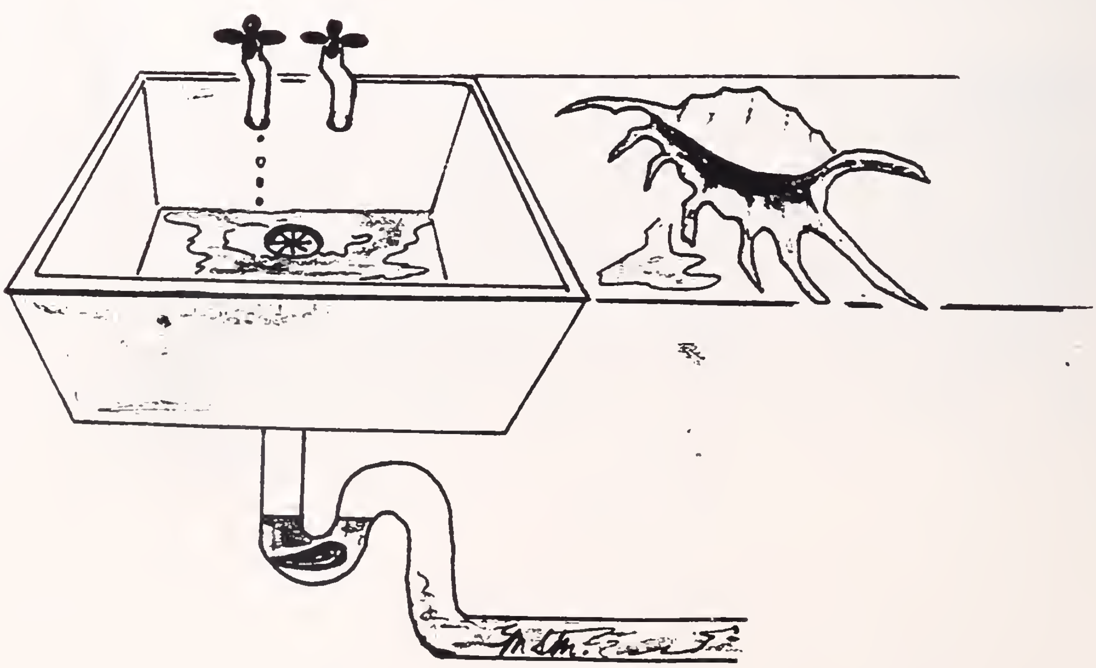
Live taken specimens for dissection can be kept alive for up to a week in a container with seaweed (no seawater). If deep frozen they are not so easy to dissect.

(h) Plastic box:

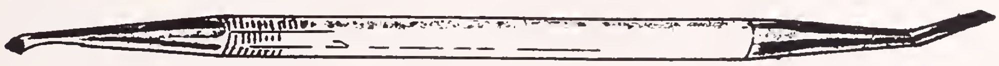
There is now a plastic box on the market which has a slicker pad in the lid. This keeps specimens cool for the travelling collector.

(i) Washing out:

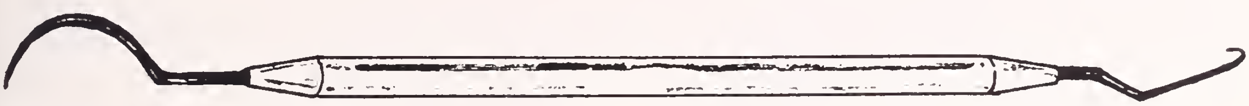
Wait until the animal is well rotted, or alternatively soak for a week in a 50% meths solution. Keep the operculum (N.B. Bullina lineata has one!). If you haven't already extracted the operculum, squirt the shell over a bucket or put the plug in the sink. Some washed up shells have the operculum still inside. As well as a sharp squirt from the tap or hose, a quick flick of the wrist may dislodge the animal. A coiled wire tool or dentists tool may help. A size range of fish hooks is especially useful on shells with narrow apertures such as cones. If not totally successful the shell can be soaked in water with a pinch of salt added. Change this water daily to prevent shell damage by acidic water. Resquirt at intervals until the shell is clean.



RECYCLED DENTIST'S TOOL broken ends reground to a chizel edge for cleaning shells.



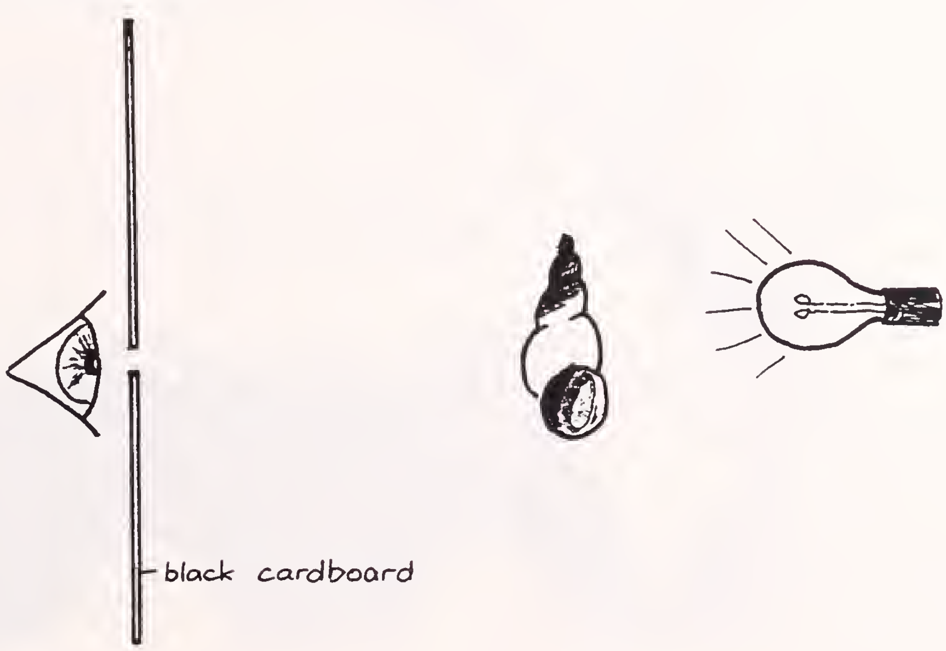
DENTIST'S TOOL for extracting bodies + hermits.



(j) Desperation measures:

The animal **still** inside and smelling? To check which shells need further treatment, make a small hole in a piece of black cardboard as shown below. Look through the hole at the shell against a strong light. The dark remains in the spire indicate the culprit - further treatment is required!

CHECKING FOR REMAINS



Hydrogen peroxide, caustic soda solution, or 100% Janola can be dropped directly into the aperture (see below). An old egg carton is handy support to keep the aperture upwards. Leave for several days and then resquirt to remove the animal parts, repeating if necessary. CAUTION - beware of damage to skin and eyes from caustic soda. It is essential to soak shells in water after chemical treatments to prevent long term damage. Alternative strategies are dropping 70% meths or alcohol into the aperture and allowing to dry; sealing off the aperture with melted wax; pouring shellac into the aperture; and finally for large shells, drilling a fine hole near the apex and blowing out the remains.

USING AN EGG CARTON FOR SUPPORT

REMOVING ENCRUSTATIONS:

Janola bleach:

Completely immerse the shell in a 10 - 50% solution of bleach for five minutes to twelve hours. Start with a weak solution for a short time, and gradually increase the concentration if not successful. Check if the encrustation is becoming loose. A large shell can be treated in a plastic bag which is shaken occasionally. When the encrustation is chipping off use a wire brush, copper for preference, on tougher shells. A sharpened dentists chizel used under a lens is more precise for delicate or precious specimens like *Chlamys* and *Murex* species.

Diluted Hydrochloric acid (50%):

Use with extreme care; and use goggles as acid in the eye can blind. People with sensitive skin should use gloves. Heavy, stained, or eroded shells such as volutes respond well to this method. Remember, you are dissolving off the outer layer - once too many times makes a hole! Use glass containers. Have a container of water beside you to plunge the shell into and stop the reaction instantly at the desired stage. Dip or paint on the acid briefly; and do not allow the acid into the aperture. Vaseline can be smeared on parts not needing more treatment. Afterwards, soak thoroughly in clean water. A final polish with Scotchbrite, wet and dry sandpaper, then Brasso when dry, can recreate the original gloss.

Lemon Juice:

I have not tried this - use as for acid, a less dangerous method.

PERIOSTRACUM TREATMENT:

This maintains the natural look of the outer periostracum eg Ranellids. It is essential to keep the periostracum wet during the cleaning stage. When clean apply either:

Norman Douglas recipe:

Make up to 350ml with one part glycerine to two parts water; and add one dessertspoon of neutralised formalin. The latter is made by adding garden lime to formalin to make a saturated solution.

50% glycerine 50% isopropyl alcohol:

I prefer this as it seems less likely to go mouldy. Keep a close check on specimens, especially in humid Auckland. Reapply at yearly intervals. Mouldy spots can be checked with a dab of meths.

60% PVA glue 40% water:

This is Bob Pennikets method - just paint on and allow to dry. It has the advantage of reattaching any pieces of periostracum that are cracking off.

FINAL PREPARATION:

- Glue the operculum onto cotton wool using a water based glue. Make sure it is the right way up!

- If needed, write a catalogue number on the shell.

- Baby oil applied very sparingly will bring up the colour and gloss on some species. Neopol polish renews the shine on *Cypraea*. Too much of either will attract dust and stain labels.

- Write out the label with full details. Labels should be inside tubes.

BYNE'S OR MUSEUM DISEASE:

Despite the name, this condition is not due to bacteria or fungi; but is a chemical corrosion evidently caused by residual traces of acids or alkalis. It can develop ten to fifty years after collection, and shows up as a powdery white covering. If left, this thickens and eventually penetrates the layers of the shell. A small shell may totally disintegrate. To prevent your collection suffering note the following points:

- seal any particle board used in cabinets with several layers of varnish
- do not use oak cabinets as they give off acidic fumes
- have your cabinets well ventilated
- metal boxes and shelves are ideal
- cheap soda glass emits alkaline fumes
- microscopic shells are best in gelatin capsules inside another tube for protection
- avoid cotton wool, especially in tightly sealed containers, as both caustic and acid is used in some manufacturing processes - cellulose is better
- corks give off acidic fumes, but plastic stoppers are okay
- foam plastic eventually deteriorates and shells stick to it, and the same goes for Blu-tak
- do wash and dry all specimens before storage
- check your collection regularly

If Byne's disease is noticed, wash off all traces and seal the shell surface with oil.

SUMMARY:

Most shell books give shell cleaning information but different sources often give conflicting advice. I have either used the methods discussed in this article myself with success or have had them personally recommended to me. However, I hope this article will spark further debate.

ACKNOWLEDGEMENTS:

To the late Norman Douglas and Bob Penniket for much information and inspiration. Thanks to Peggy Town for the methods involving using acids, and to the many members of the Conchology Section for their contributions.

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Poirieria Vol 5 Page 32 "Preserving chitons"

Poirieria Vol 14 No 2 Page 6 "Periostracum preservation" by Norman Douglas

"Sea shells of Southern Africa" - the section on how to look after the collection

"New Zealand Mollusca" by A W P Powell Page 1

"Compendium of seashells" Page 14 by R Tucker Abbot and S Peter Dance

POIRIERIA

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Conchology Section

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Lorica haurakiensis Mestayer 1921 by Bruce Hazelwood

This species has been known to occur in New Zealand waters since the turn of the century. At that time Suter 1907, recorded a single valve dredged at 25 fathoms near Channel Island in the Hauraki Gulf. This he named *Lorica volvox* (Reeve). When more specimens came to light, the New Zealand form was then described as new by Mestayer, 1921. Events prior to its description are well documented by Iredale & Hull, 1930. Type description and all known information up to that date are given.

My intention is to compile information from both old and new publications.

The following is the text regarding *Lorica* from New Zealand waters as described by Iredale & Hull 1930:

Family Loricidae:
This family, a very characteristic feature of the extratropical Australian Loricate fauna, appears in the north of New Zealand, a somewhat unexpected occurrance.
The species are few in number, and three genera are recognised in Australian waters, but only one genus and species is so-far recorded from the Neozelanic Region. It will be interesting to watch for its discovery in the Neozelanic fossil beds, as the family is well represented in the palaeontology of Australia.
The peculiar posterior valve with its unslit posteriorly sinuate insertion plate, and the scaly girdle more or less interspersed with spiculous tufts, make the members easily recognisable.

Genus *Lorica*:
Shells medium to large, more or less elevated, keeled elongately ovate, girdle scaly with corneous tufts. Colour generally dull, sometimes brightly streaked. Sculpture consists of radial rows of distinct pustules on the end valves and lateral areas, and raised longitudinal lines of coalesced pustules, sometimes with cross threads on the central areas. Girdle notably slit posteriorly, covered with oval scales of different sizes, somewhat loosely packed with scattered spiculous tufts more or less evenly distributed. Insertion plates large, striated in anterior and median valves; the former eight-slit, the latter one slit; sutural laminae large, sinus very small, with a projecting subdenticulate block present, posterior valve with an unslit callus somewhat sinuate.
Zelorica was provided by Finlay for the Neozelanic species, as the girdle examined showed no spiculous tufts. This conclusion requires confirmation from the study of juvenile specimens as the type species of *Lorica, cimolia,* generally has the tufts absent in the adult, but they can be found in very small specimens. The Sydney *Lorica, volvox,* has very numerous tufts at all stages, well preserved specimens showing three or four rows somewhat alternating.

Lorica haurakiensis:
Many years ago Hutton described a shell, apparently from New Zealand, in the Colonial Museum, as *C. rudis* and later this was recognised as a species of *Lorica,*

determined as the Sydney species, and dropped from the Neozelanic list. Some forty years after Huttons description Captain Bollons found a species of *Lorica* living in the Hauraki Gulf, and it was recorded as the Sydney species. A specimen was given to Hull by Captain Bollons, and sent to Iredale for comparison with the types in the British Museum. It was found to differ appreciably, but could not be described until comparison had been made with the type of Huttons *rudis*. This was done by Miss Mestayer, who showed that Huttons shell was a Sydney specimen, and therefore the Neozelanic species needed description, which was offered as follows:

"Shell ovately oblong, steeply elevated, dorsal ridge acute, side slopes very slightly convex. Anterior valve erect, lightly curved forward, with fourteen irregularly spaced radial ribs, smooth for about two-thirds of their length, but bearing near the girdle from four to six low, steeply rounded nodules; the interstices show faint concentric growth-lines; posterior angles of the apex finely vertically ribbed. Median vallves. The first of these is considerably larger than the others, the jugal area sculptured with oblique radial ribs, which form inverted 'V' up it; pleural areas finely horizontally ribbed. In valves 3 to 8 the horizontal ribbing is continued across the jugal tract. The number of ribs varies with the age of the shell; the holotype has nineteen horizontal ribs, the interstices rather wider and perfectly smooth. The lateral areas raised, somewhat variable, some having one or three more or less decided radial riblets, but they may be obsolete on one or more of these areas. A few low, steeply rounded nodules are rather irregularly scattered over the riblets. Posterior edges of valves denticulate, and showing traces of fine vertical striae at the apex. The concentric growth-lines are clearly visible. Posterior valve the smallest, horizontally ribbed, bounded by a strong slightly upstanding rib, bearing a few nodules. In some specimens there are traces of fine vertical riblets on the posterior angle. The mucro is terminal. The valve rather deeply grooved posteriorly. Girdle medium width, closely set with with smooth convex scales, which vary slightly in size. There are no tufts or bristles; the posterior slit extends the whole length of the girdle. Colour reddish-brown with a fairly broad creamy-yellow bar along the centre of the shell. The girdle about the same colour, with darker transverse bars. Individual specimens appear to vary somewhat in colour. Interior reddish, sutural plates almost white, sinus very narrow, rather shallow. Anterior valve with about eight slits, median valves one slit. Length 30mm; breadth 20mm. Off Kawau Island, Hauraki Gulf, New Zealand, 20 fathoms."

History of species nomenclature:

1852 *Lorica* H & A Adams, Ann.Mag.Nat.Hist.(2) 9: 355
1853 *Aulacochiton* Shuttleworth, Mittheil naturf Gessell Berne 68
1907 *Lorica volvox* Suter, Proc.Mal.Soc.,111, 297
1913 *Lorica volvox* Suter, Man.N.Z.Moll.,46 Atlas pl 2, fig 22 pl 5, fig 3
1915 *Lorica volvox* Iredale, Trans.N.Z.Inst.XLVII, 1914, 425
1921 *Lorica haurakiensis* Mestayer, Trans.N.Z.Inst.LIII, 1920, 177

1924 *Lorica haurakiensis* Finlay, Trans.N.Z.Inst.LVI, 517
1926 *Lorica haurakiensis* Mestayer, Trans.N.Z.Inst.LVI, pl 101 fig 10
1926 *Zelorica* Finlay, Trans.N.Z.Inst.LVII, 334
1930 *Lorica haurakiensis* Iredale & Hull, Aust.Zoo.,Vol 6, Part 2
1937 *Lorica haurakiensis* Powell, Shellfish of New Zealand
1941 *Aulacochiton* Cotton, Rec.S.Aust.Mus., Vol. 6, p 437
1946 *Lorica haurakiensis* Powell, Shellfish of New Zealand
1951 *Aulacochiton haurakiensis* Dell, Tuatara Vol IV, Nnmber 1
1957 *Aulacochiton haurakiensis* Powell, Shells of New Zealand
1960 *Lorica* Smith, Treatise on Invertebrate Pal. Part 1, Moll 1, 351-216
1961 *Aulacochiton haurakiensis* Powell, Shells of New Zealand
1967 *Aulacochiton haurakiensis* Powell, Shells of New Zealand
1967 *Lorica haurakiensis* Beu, N.Z.Jl.Mar.Freshwater Res., 475-481
1969 *Lorica haurakiensis* Fitzgerald, Poirieria Vol 5, Part 2, 21-32
1972 *Lorica* Beu, The Bull.of Zoo.Nom., Vol 29, Part 4, 167-228
1976 *Lorica* Ruling, The Bull.of Zoo.Nom., Vol 32, Part 4, 193-290
1976 *Lorica haurakiensis* Powell, Shells of New Zealand
1977 *Lorica haurakiensis* Beu, Cookia Vol 2, No 2
1979 *Lorica haurakiensis* Powell, New Zealand Mollusca
1982 *Lorica haurakiensis* Walsby & Morton, Leigh Marine Lab
1990 *Lorica haurakiensis* Beu & Maxwell, N.Z.Geol.Surv.Pall., Bull 58

The family Schizochitonidae Dall 1889 was not used by New Zealand workers until Beu 1967. In 1930 Iredale & Hull used the Family Loricidae for this grouping, remaining in common usage until Dell 1951

B C Cotton (Rec S Aust Mus,1941, Vol 6, p 437) noted "that *Lorica* had been used by Bronn in 1848 for a species of Crustacea and is therefore not available for chitons. The name accepted is Aulacochiton Shuttleworth 1843, genotype *Chiton volvox* Reeve 1847."

Aulacochitonidae remained in use until Beu 1967 introduced Schizochitonidae to the New Zealand fauna.

"In recent years the name Aulacochiton Shuttleworth has generally been used in Australia and New Zealand. MacPherson & Gabriel (1962: 22) stated that *Lorica* was preoccupied, but did not give details. Sherborn (1927: 3673) listed under *Lorica*: "err. typ.pro Loricula; teste Bronn Ind Pal 1848,669." Reference to Bronn showed that the earlier *Lorica* is an error for *Loricula* Sowerby 1843 (Cirripedia). As such it is an incorrect subsequent spelling and does not enter into homonymy (International Commision on Zoological Nomenclature 1961 Art 33b). *Lorica* is thus available for the genus of chitons, and was used by Smith (1960: 163)

The reason for the substantially different family names in the "Treatise" and in earlier New Zealand classifications is that prior to the "Copenhagen Decisions on Zoological Nomenclature" in 1931 the Law of Priority did not apply to family names, and Iredale frequently erected names based on the oldest established genus in the family. These names have become well established in the literature, but there are many cases where they must be replaced by the earliest name for the family. Smith 1960 has returned to the usage of the correct name for each family."

In the same paper Beu 1967 reviewed the species, listing specimens from the then "Dominion Museum" (now the National museum of New Zealand). He recorded the first fossil record of *Lorica haurakiensis* from the New Zealand Tertiary, saying that the single valve was indistinguishable from recent *haurakiensis* (locality - Mangatahi River near the junction with Okanawa Stream, Central Hawkes Bay).

Fitzgerald 1969 lists *Lorica haurakiensis* in a review of the New Zealand fauna.

Beu 1972 submitted evidence to the "Int Com Zoo Nom" requesting the reinstatment of *Lorica*. In 1976 they ruled that this name was available (ICZN Opinion 1044).

Beu & Maxwell 1990 record the fossil history of *Lorica haurakiensis* in "Cenozoic Mollusca of New Zealand" pages 332-333, 359, 425 and Plate 43 b,d. They stated that "this is one of the largest and more common of fossil chitons." It is found from Waipipian to recent; and localities where it has been found include Waverly Beach, Waihi Beach, Hawera, Hawkes Bay, Ohope Beach, and Whakatane.

Lorica haurakiensis is less common in living fauna. Since its description it has been collected sporadically, mostly from deeper water. Intertidal specimens are usually very small. I have only one small juvenile so I cannot comment authoritively as to whether they display spiculous tufts on the girdle as do the related Australian species. *Lorica haurakiensis* is still an uncommon species, although SCUBA divers encounter it relatively frequently at around 7 to 15m, finding it under large flat rocks. In dredging it is found on large bivalves such as *Glycymeris laticostata* and *Atrina zelandica*, and on rocks.

Lorica haurakiensis is so far unknown from some areas. These are Three Kings Islands, Chatam Islands, Stewart Island, and the Subantartic Islands. It has been found from intertidal to depths of 100m.

The illustrated specimen of this species has spikes protruding from the girdle. I have examined many specimens, many small, but they do not display spiculous tufts. Steve O'Shea has examined the illustrated specimen from Kapiti Island and has identified the "spikes" as a small erect tubula bryozoan, possibly a species of either Zoobotryon or Bowerbankia.

Locality data for specimens of this species in the Auckland Institute and Museum, the National Museum of New Zealand (holotype and paratypes), the Paleontology Section

of the DSIR, and in the Hazelwood collection are shown on the accompaning map.

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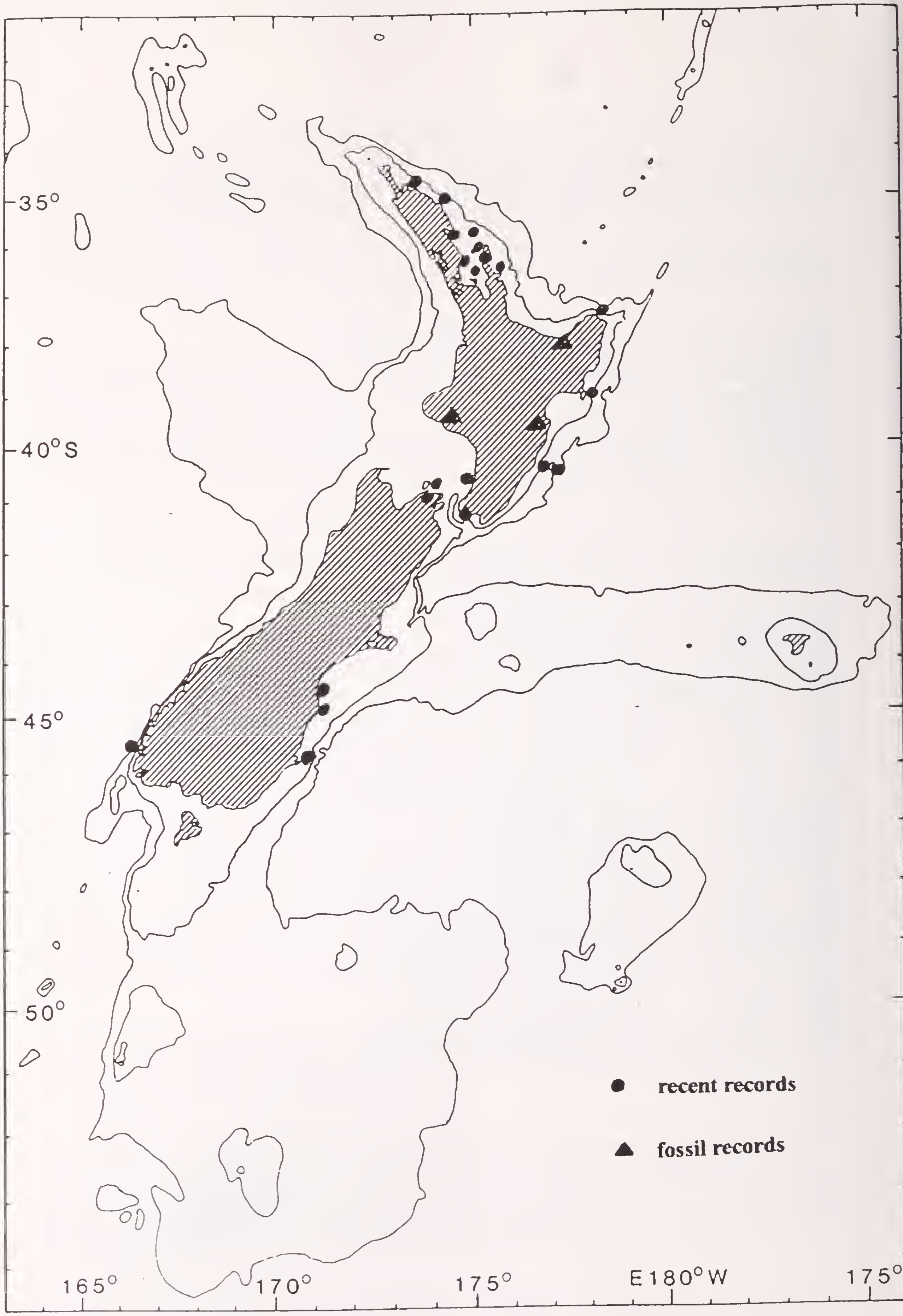
Steve O'Shea   for literature
Don Watson   for trawled material
Norm & Noel Gardiner   for literature

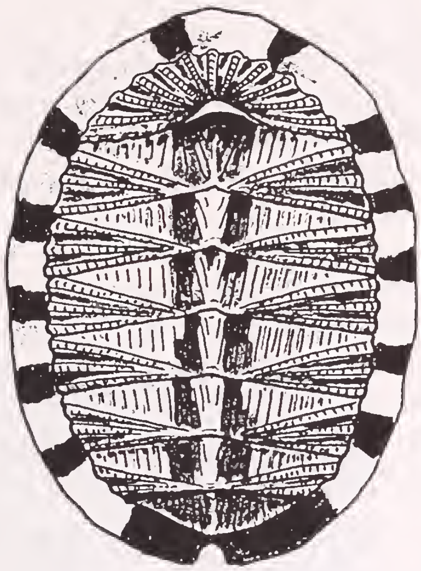
Family History of *Lorica* in New Zealand:

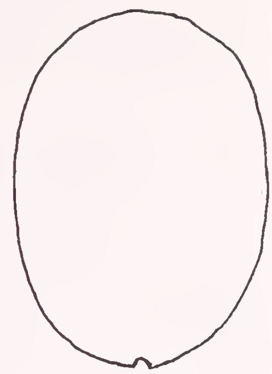
1921	Mestayer	Ischnochitonidae	
1926	Finlay	Zelorica	
1930	Iredale & Hull	Loricidae	
1937	Powell	Loricidae	
1946	Powell	Loricidae	
1951	Dell	Aulacochitonidae (by association)	
1957	Powell	Aulacochitonidae	
1961	Powell	Aulacochitonidae	
1967	Powell	Aulacochitonidae	
1967	Beu	Schizochitonidae	Dall 1889
1969	Fitzgerald	Schizochitonidae	Dall 1889
1976	Powell	Schizochitonidae	Dall 1889
1977	Beu	Schizochitonidae	Dall 1889
1979	Powell	Schizochitonidae	Dall 1889
1989	Vaught	Schizochitonidae	Dall 1889
1990	Beu & Maxwell	Schizochitonidae	Dall 1889



35°
40°S
45°
50°
165°
170°
175°
E180°W
175°
recent records
fossil records

Lorica haurakiensis Mestayer, 1921





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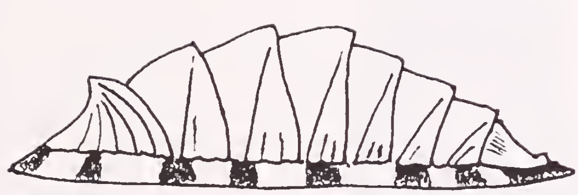


Profile

Specula retifera (Suter 1908) **Margaret Morley**

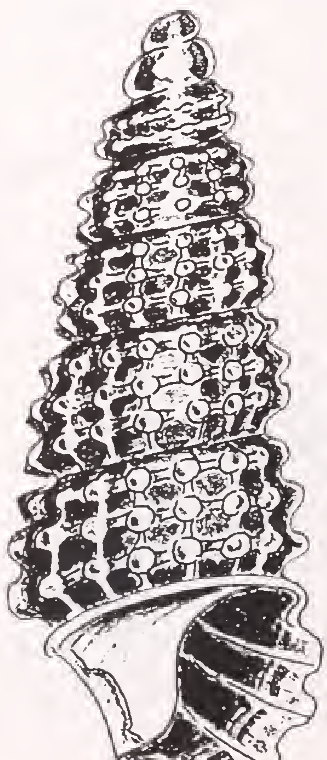
This is number five in the series "visible evidence"; that is, species not illustrated by Powell in "New Zealand Mollusca". *Specula retifera* is in the family Cerithiopsidae. The specimen illustrated was dredged off Otago by scallop boats in August 1988. The type specimen was dredged in fifty fathoms (91m) off the Snares Islands by Captain Bollons.

Powell descibes this species as follows: "Protoconch large, blunt tipped of two smooth whorls. Shell solid, with a channelled suture and bold clathrate sculpture composed of three strong spiral keels, points of intersection prominantly nodose, plus a weaker smooth keel encircling the upper base. Colour buff." Suter states that the operculum is unknown. My specimen is live taken with a pale ochre yellow operculum. The drawing is a mixture of high magnification and a little guesswork!

<u>REFERENCES</u>:

Powell A W B 1979 "New Zealand Mollusca" Page 133

Suter H "Manual of the New Zealand Mollusca" Page 243, Plate 14 fig 14
(as *Bittium retiferum*)



Specula retifera (Suter 1908)
Dredged off Otago
Height 3mm
Width 0.9mm

msm.

Life on the Rainbow Warrior

by Tony Enderby

The Rainbow Warrior was sunk for the second time (I am assuming you do not wish to be bored with the details of the original sinking) in December 1988 off Matauri Bay in the shelter of the Cavalli Islands. She lies in approximately 80 feet of water on a clean sandy bottom, the top of her superstructure is around sixty feet depth.

The top of the ship has a reasonable covering of Eklonia kelp although this does not extend far beyond the very top structures of the ship although small odd plants can be found on most of the more accessible lower areas.. As you drift down towards the deck the vast schools of fish which have made the ship their home become apparent. Considering that none of the fish would normally be found in this location there is probably a good case for some form of protection around the ship in the form of a marine reserve or similar.

Species found in large numbers over and around the wreck are snapper, kingfish, kahawai, blue and pink maomao, john dory, spotty, sandagers parrot fish and leatherjacket. On moving in close to the deck smaller blennies, goatfish, kelpfish, marblefish and blue cod are settled. On entering the enclosed areas huge schools of big eye are found, the forecastle and bridge areas both house very large numbers. The holds house golden snapper although a further school is also resident under the stern of the ship.

Anemones and sponges on the rails of the Rainbow Warrior

The ship sits with a slight list to port and it is this side which is home to the greatest number of encrusting species, predominantly the jewel anemone, *Corynactis haddoni* which appears in all the colours of the rainbow and is also larger than most other sites on which it is found. It seems to share many of the bare parts of the ship and some of the railings with *Actinothoe albcincta,* the common anemone which shows up as a vivid white against the dark areas of the ship. Sponges are also common in this area and also on the remaining rails of the ship. Calcareous sponges, horny sponges, encrusting and staghorn sponges all seem at home under the kelp and in an around the anemones and hydroids. Some of them on the railings next to the bridge have attained quite large size in the last 2 years I have observed them.

The railings, some of which have been broken by anchors being caught and winched clear and the front and roof of the bridge which have collapsed are the first casualties of the ship being under water and I suspect most of the rails will be gone within the next five years.

Tiger shells, both *Maurea tigris* and *Maurea punctulata* re found among the sponges and anemones on the hull and also on the decks. *Ancorina* sponges of small size can be found on some of the lower parts but to date no *Maurea osborni* were seen on them, perhaps they will arrive later. Both species observed were fully mature and in quite large numbers.

We found two small octopus, both about 30cm across the legs in the area and both had large numbers of *Maurea tigris* around the edge of their homes, all with a pinprick sized hole in the spire of the shell, some even had the operculum still in the mouth.

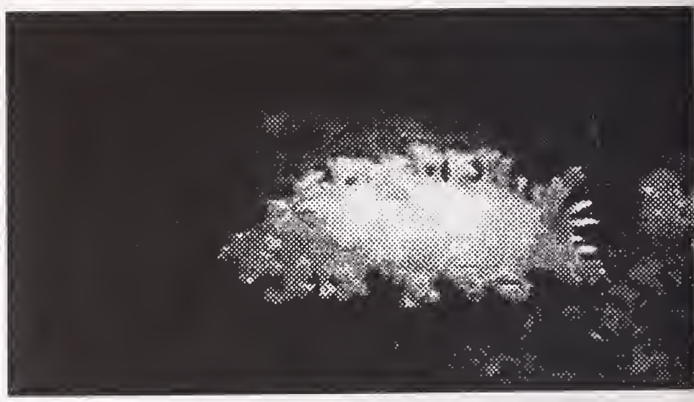
The decks are covered in shell debris of *Maoricolpus* and *Ostraea* shells in amongst the shell grit on which I assume have been washed from the surrounding bottom in storms as no live ones were to be found on the deck. The shell grit would be an interesting project to collect and sort through at some stage. Several small (50mm) live *Astraea zealandica* were found amongst this debris on the forward deck.

On the walls on the main superstructure *Charonia capax* were nestled in cracks, normally single or two specimens of medium size up to 80mm but not in large numbers. Small *Cabestana spengleri* and *Mayena australasiae* of similar size were also seen, more commonly on the port side below the collapsed bridge section.

The beautiful pink and white nudibranch *Jason mirabilis*

The most common mollusc seemed to be the beautiful nudibranch *Jason mirabilis* which is found almost all over the walls of the superstructure and hull and always grazing on *Solanderia* hydroid. We counted a dozen pairs in a very small area and also the beautiful lilac coiled egg masses. I have not seen such large specimens or numbers as those living on the Warrior. The numbers have remained constant over the past two years I have dived in the ship. The jewel nudibranch *Dendrodoris gemmacea is* also found in numbers amongst the growth on the outside if the hull.

A new arrival that I found only on my most recent dive on the Warrior was the very large apricot coloured nudibranch *Tritonia incerta.* Numbers of these were to be found in the more sheltered parts of the decks and also on some of the rails. These ranged from mature specimens over 100mm in length to juveniles about a third of that size.



The large orange nudibranch *Tritonia incerta*

It is quite amazing the marine life which has made the wreck of the Rainbow Warrior its home. In the relatively short time it has been at the site and the large numbers of charter and private boats which bring divers to see the ship. The ship should be given some sort of protection so it can be enjoyed by both the animal communities living on it and the divers who come to visit.

The ship is a diver photographers paradise and we were lucky enough to have two days when we were the only divers on the ship, although drifting between 60 and 75 feet we felt disappointment at having to head for the surface with air remaining in our tanks but definitely no unexposed film left in the cameras.

TE WERAHI BEACH, CAPE REINGA
THE DISCOVERIES OF THREE MOLLUSCATEERS

Michael K. Eagle

Nestled in the lee of the famed lighthouse at Cape Reinga lay the gently curving beach of Te Werahi. Bounded in the south by raupo swamp and flanked by volcanic hills, wandering sanddunes that host many maori middens drifted over hard clay banks. Burnished red and brown rocks from old cooking fires littered the slopes. Occassional pieces of charcoal and bleached bone were to be found buried in the mounds. Various seabird tracks meandered across damp, flattened pans, then dissappeared in all directions. The north facing beach was a roughened ribbon, littered with driftwood, seaweed , sponges and a dead army of whitewashed sentinels (including the odd sub-fossil Placostylus), weathered in the bright sun and gusting wind.

In a moment of pure serendipidy we came (Margaret Morley, Glenys Stace and me), to this far north classic collecting locality in search of Molluscs. Not the sort that you find on just any New Zealand surf beach, but exotic local or uncommon species to add to our growing collections. After a week fossicking in Parengarenga Harbour (both recent and fossil forays), we tramped the scenic track to the beach with dogged determination.

Following is a species list gleaned from about two hours on the beach. Not all were taken, and the list is representative of the washup tide line only.

MOLLUSCA

AMPHINERA

CALLOCHITITONIDAE	Eudoxochiton nobilis (Gray, 1843)

GASTROPODA

HALLIOTIDAE	Haliotis (Sulculus) virginea crispata Gould, 1847
PATELLIDAE	Cellana denticulata (Martyn, 1784)
TROCHIDAE	Cantharidus opalus opalus (Martyn,1784)
	Zeathalia zelandicum (Hombron & Jacquinot, 1855)
TURBINIDAE	Astrea heliotropium (Martyn, 1784)
	Cookia sulcata (Gmelin, 1791)
	Turbo smaragdus Gmelin, 1791
NERITIDAE	Nerita (Melanerita) atramentosa melanotragus E.A.Smith, 1884
TURRITELLIDAE	Maoricolpus finlayi Powell, 1940
	Zeacolpus (Stiracolpus) ahiparanus (Powell, 1927)
VERMETIDAE	Stephopoma roseum (Q & G, 1834)
PLANAXIDAE	Hinea brasiliana (Lamarck, 1822)

CALYPTRAEIDAE	Sigapatella novaezelandiae (Lesson, 1831)
	Sigapatella superstes Fleming, 1958
	Zegalerus tenuis (Gray, 1867)
	Zegalerus terraenovae (Peile, 1924)
	Maoricrypta costata (Sowerby, 1824)
TONNIDAE	Tonna cervisina Hedley, 1919
	Tonna melanostoma (Jay, 1839)
CYMATIIDAE	Monoplex parthenopeus (Salis, 1793)
MURICIDAE	Thais orbita (Gmelin, 1791)
	Haustrum hastorium (Gmelin, 1791)
BUCCINIDAE	Cominella (Josepha) quoyana necopinata (Finlay, 1930)
	Bucinulum vittatum vittatum (Q & G, 1833)
	Bucinulum mariae Powell, 1940
OLIVIDAE	Amalda (Baryspira) australis (Sowerby, 1830)
EPITONIUM	Epitonium (Gyroscala) perplexum (Pease, 1867)
	Cirsotrema zelebori (Dunker, 1866)
JANTHINIDAE	Janthina janthina (Linnaeus, 1758)
BULIMULIDAE	Placostylus (Maoristylus) ambiguosus priscus Powell, 1938 (sub-fossil)
BIVALVIA	
ARCIDAE	Barbatia novaezealandiae (E.A. Smith, 1915)
GLYCYMERIDAE	Tucetona (Grandaxinaea) laticostata (Q & G, 1835)
	Glycymeris (Glycymerula) modesta (Angus, 1879)
MYTILIDAE	Perna canaliculus (Gmelin, 1791)
	Modiolus areolatus (Gould, 1850)
	Modiolarca impacta (Hermann, 1782)
PECTINIDAE	Pecten novaezelandiae (Reeve, 1853)
	Mesopeplum convexum (Q & G, 1835)
	Chlamys gemmulata (Reeve, 1853)
	Chlamys zeelandona (Hertlein, 1931)
	Chlamys zelandiae (Gray, 1843)
LIMIDAE	Limatula maoria Finlay, 1927
	Limatula aupouria Powell, 1937
ANOMIDAE	Monia zelandica (Gray, 1843)
LUCINIDAE	Divaricella (Divalucina) huttoniana (Vanatta, 1901)
	Felaniella (Zemysia) zelandica (Gray, 1835)
CARDITIDAE	Purpurocardia purpurata (Deshayes, 1854)
	Purpurocardia reinga Powell, 1933
	Pleuromeris zelandica (Deshayes, 1854)
MACTRIDAE	Mactra discors Gray, 1837
	Spisula (Crassula) aequilateralis (Deshayes, 1854)
	Zenatia acinaces (Q & G,1835)
	Resana lanceolata Gray, 1852

MESODESMATIDAE	Paphies australis (Gmelin,1790)
	Paphies subtriangulata subtriangulata (Wood, 1828)
	Paphies ventricosa (Gray, 1843)
TELLINIDAE	Macomona liliana Iredale, 1915
PSAMMOBIIDAE	Gari lineolata (Gray, 1835)
	Gari strangeri (Gray, 1843)
VENERIDAE	Dosinia (Phacosoma) subrosea (Gray, 1835)
	Dosinia (Phacosoma) maoriana Oliver, 1923
	Dosinia (Austrodosinia) anus (Philippi,1848)
	Tawera spissa (Deshayes, 1935)
	Protothaca (Tuangia) crassicosta (Deshayes, 1835)
	Irus reflexus (Gray, 1843)
	Venerupis (Paphirus) largillierti (Philippi, 1849)
	Gomphina (Gomphinella) maorum E.A. Smith, 1902
	Austrovenus stutchburyi (Wood, 1828)
MYOCHAMIDAE	Myodora striata (Q & G, 1835)
CEPHALOPODA	
SPIRULIDAE	Spirula spirula (Linnaeus, 1758)

Amongst the treasures and joys contained therein were three double valve Gomphinas in pristine condition with nice colour and pattern. The Epitonium (Gyroscala) was a rare discovery, and the Stephopoma unusual. The Hinea was stripped of the periostracum and beach worn and the broken Tonnas' were nothing more than wishful thinking. The evening sunset was worth the trek.

PASTTIMES AND FOSSIL FUN

MICHAEL K. EAGLE

On Sunday October 11, in wonderful, clear, sunny weather, a team of enthusiastic, amateur, paleontologists embarked on an Auckland Institute and Museum geology field trip in search of Lower Miocene fossils on Waiheke Island. We all clambered aboard the M.V. Acheron (late of Fiordland and Stewart Island) and leisurly sailed the sparkling Waitemata Harbour toward the inner gulf islands. An informative narration and distant visual appreciation of North Shore, Rangitoto Island, and Motukorea Island volcanics preceeded our eventual seaward landing (by ships' tender) at Fossil Bay.

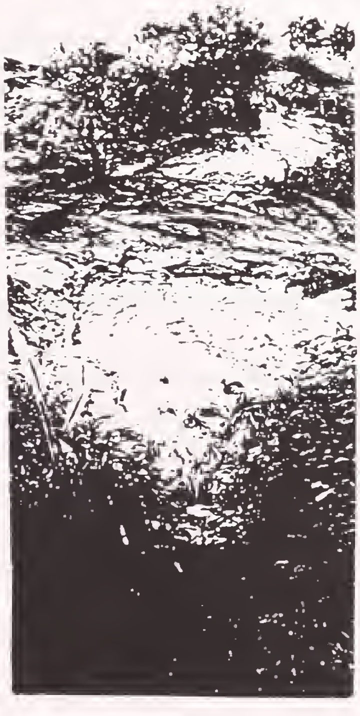
Much of Fossil Bay is made up of Otaian (22 million years old), ancient Waitemata Basin sediments derived from an eroded greywacke coastline and the shells of animals that accummulated there. Evidence of this Mesozoic greywacke was found in an exposed outcrop on the NNW end of the beach (unfossiliferous). Subsidence in the early Miocene epoch was such that bathyal depths of between 1500m and 2000m existed, enabling North Kaipara silt and sandstone slurries to cascade into the basin . Accumulating sediments, often enhanced by submarine mudflows, buried communities of marine organisms. This whole period, now uplifted and exposed in the cliffs and rocky shore platforms at Fossil Bay, provided many clues to the paleoecology and geological events that probably occurred.

Some sandstone and mudstone beds have molluscs, echinoderms, and annelids preserved insitu, however, most fossils have travelled and been worn prior to stasis. Bioturbation is evident in coarse, sandy sediments, and the subtropical rock -boring pholad bivalve *Parapholas aucklandica* (now extinct in New Zealand) was found in reasonable numbers. Other fossil bivalves included : *Anomia trigonopsis, Bartrumia oneroaensis, Crenostrea gittosina, Diplodonta (Zemysina) cf. globus, Dosinia (Rainia) bensoni, Eucrassitella ampla, Hedicardium (Titanocardium) greyi, Isognomon sp.,Notocorbula pumila, Nucula cf. nitidula, Serripectan sp., and Tucetona aucklandica.* Common gastropods collected were : *Amalda (Baryspira) robusta, Maoricolpus waitemataensis, Paracomina lignaria, Polinices oneroaensis, Pyrazus waitemataensis, Sarmaturbo superbus, Tropicolpus (Amplicolpus) gittosinus,* and *Zefallacea bensulcata.*

The solitary fan coral *Flabellum* and colonial reef coral *Cyphastrea* were both seen, as were spines of the sea urchins *Phyllocanthus titan* and infilled tests of *Opissaster rotundas*. The colonial coral and *Phyllocanthus* prove that the paleoenvironment was sub-tropical during the Early Miocene as both are now found only in such latitudes. Several crab carapaces were also found preserved and these are thought to be *Hemiplax cf. major.*

Found locked within upper stratigraphic beds of marine, mid-shelf siltstone, in the cliffs behind the beach were the terrestrial remains of various leaves. It can only be assumed that these have originated from prehistoric rivers or streams which fed into the extinct Waitemata Basin from an eastern or perhapes southern margin of land. Of special interest was a partial leaf of *Phormium tenax* (N.Z. flax) , *Nothofagus* sp., and an Araucariacean male cone identified as *Agathis cf.australis* (the N.Z. Kauri).

We left the beach at Fossil Bay by ships'tender, just as we had arrived. The comradeship of fossil identification, distant skyline views of Auckland City and warmth of the afternoon sun enhanced a pleasant return journey past Crusoe, Motuihe, and Motukorea Islands.



The Land Snail Genus *Phenacharopa* Pilsbry, 1893
(Pulmonata: Punctoidea; Charopidae)

F M Climo
Museum of New Zealand
Te Papa Tongarewa, Wellington

Introduction:

Phenacharopa snails are associated closely with tree trunks and logs. They are commonly found under bark on rotting logs or in fungal-rich cavities inside rotting logs. They are only 1.8 - 2.3mm wide. Three species have up to 4.5 shell whorls while the fourth has about 3 more. The extra whorls are added without much increase in width in this latter example, giving the shell a tall, narrow appearance (pupiform).

Phenacharopa snails have strong axial ribs on the shell and a distinctive colour pattern. There is a particularly strong contrast between dark brown coloured zig-zags on the upper surface and the nearly white interspaces. The shell microsculpture is a reticulate net-work.

Classification:

Family: CHAROPIDAE Hutton, 1884
Genus: *Phenacharopa* Pilsbry, 1893
Type species: *Pupa novoseelandica* Pfeiffer, 1853

Phenacharopa novoseelandica (Pfeiffer, 1853) Figs 1 & 5
P. pseudanguicula (Iredale, 1913) Figs 2 & 5
P. n.sp.1 Figs 3 & 5
P. n.sp.2 Figs 4 & 5

This classification departs from earlier interpretations (e.g. Climo, 1970, pp.332-334; Powell, 1979, p.311) in the following ways:
(a) the genus is expanded to include three flatterspecies, one of which was formerly held by *Charopa* Albers, 1860
(b) *Phenacharopa pseudanguicula* (Iredale, 1913) is used as a replacement name for *Charopa (Charopa) anguicula* (Reeve, 1852) as listed by Climo (1970) and Powell (1979)
(c) two new species are recognised in the genus thus reorientated

The name change (b) has become necessary because the type specimen of *Helix anguiculus* Reeve,1852 is not the same species as the small charopid snail previously given that name in New Zealand. The type specimen of *Helix anguiculus*, from the British Museum (Natural History), is illustrated as Fig.6. It is a species of *Cavellia* Iredale, 1915, a genus belonging to another punctoid family. The replacement name, *pseudanguicula* Iredale, is based on shells from Raoul Island, Kermadec Group (Fig.5).

Biogeography:

A further two charopid genera are found in New Zealand. One of them is found in western South and Central America, from Argentina to Nicaragua.

The biogeographic limits of the *Phenacharopa* species in the New Zealand part of the Pacific are mapped in Figs.1-5. These maps are based on the Museum of New Zealand land snail collection.

Acknowledgement:

I am grateful to Ms K Way, British Museum (Natural History), for sending me the type series of *Helix anguiculus* Reeve,1852.

References:

Climo, F M, 1970 Classification of New Zealand Arionacea (Mollusca: Pulmonata). iii A revision of the genera *Charopa* Albers, 1860 (excluding subgenus *Ptychodon* Ancey,1888), *Phenacharopa* Pilsbry, 1893 and *Flammocharopa* n.gen. (Endodontidae: Endodontinae). Records of the Dominion Museum 6(18), pp.285-366

Powell, A W B, 1979 New Zealand Mollusca. Marine Land and Freshwater Shells Collins, 500p

Fig.1 Shell and locality records of *Phenacharopa novoseelandica* (Pfeiffer) (open circles) and *P.* n.sp.1 (black circles)

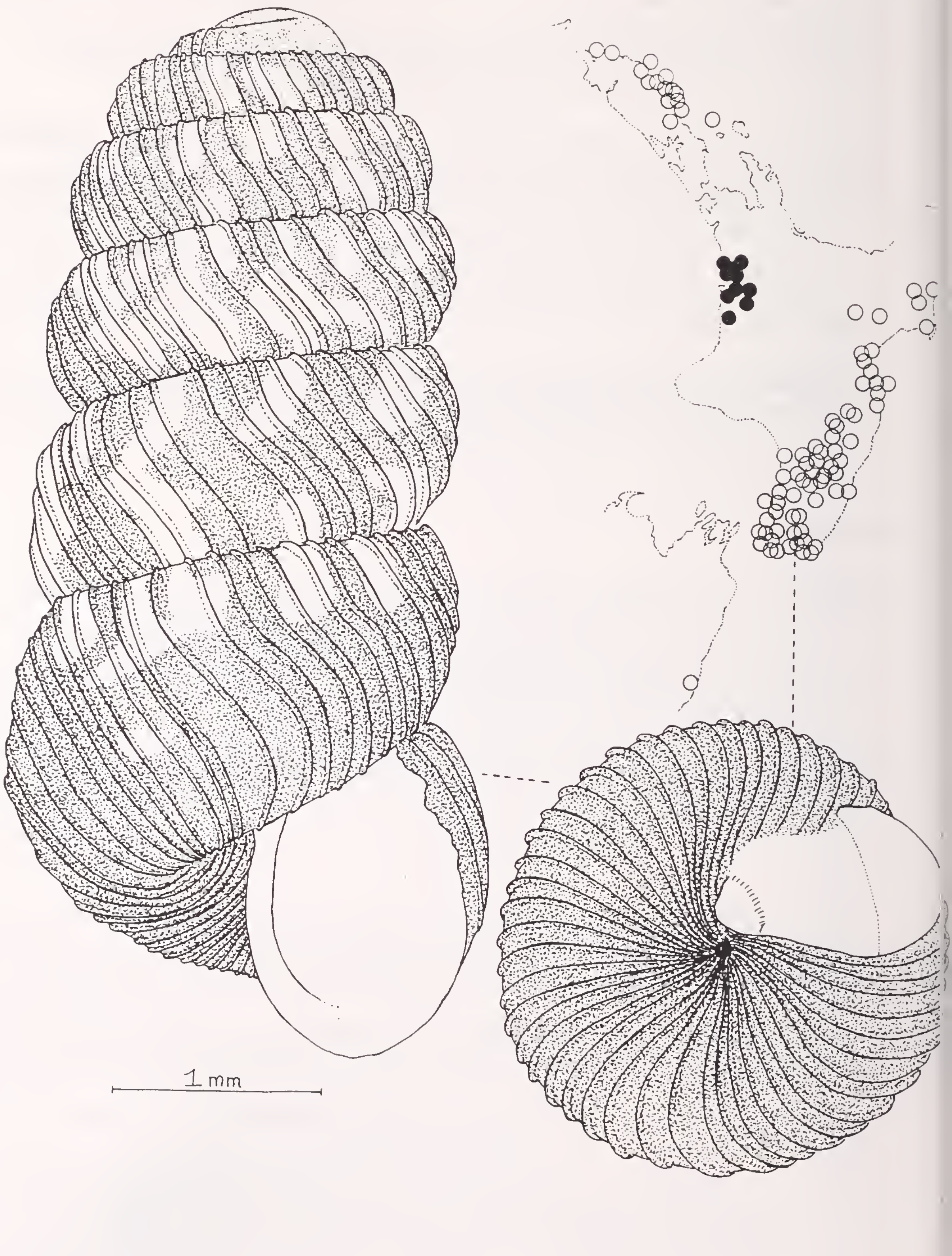


Fig.2 Shell and locality records of *Phenacharopa pseudanguicula* (Iredale)

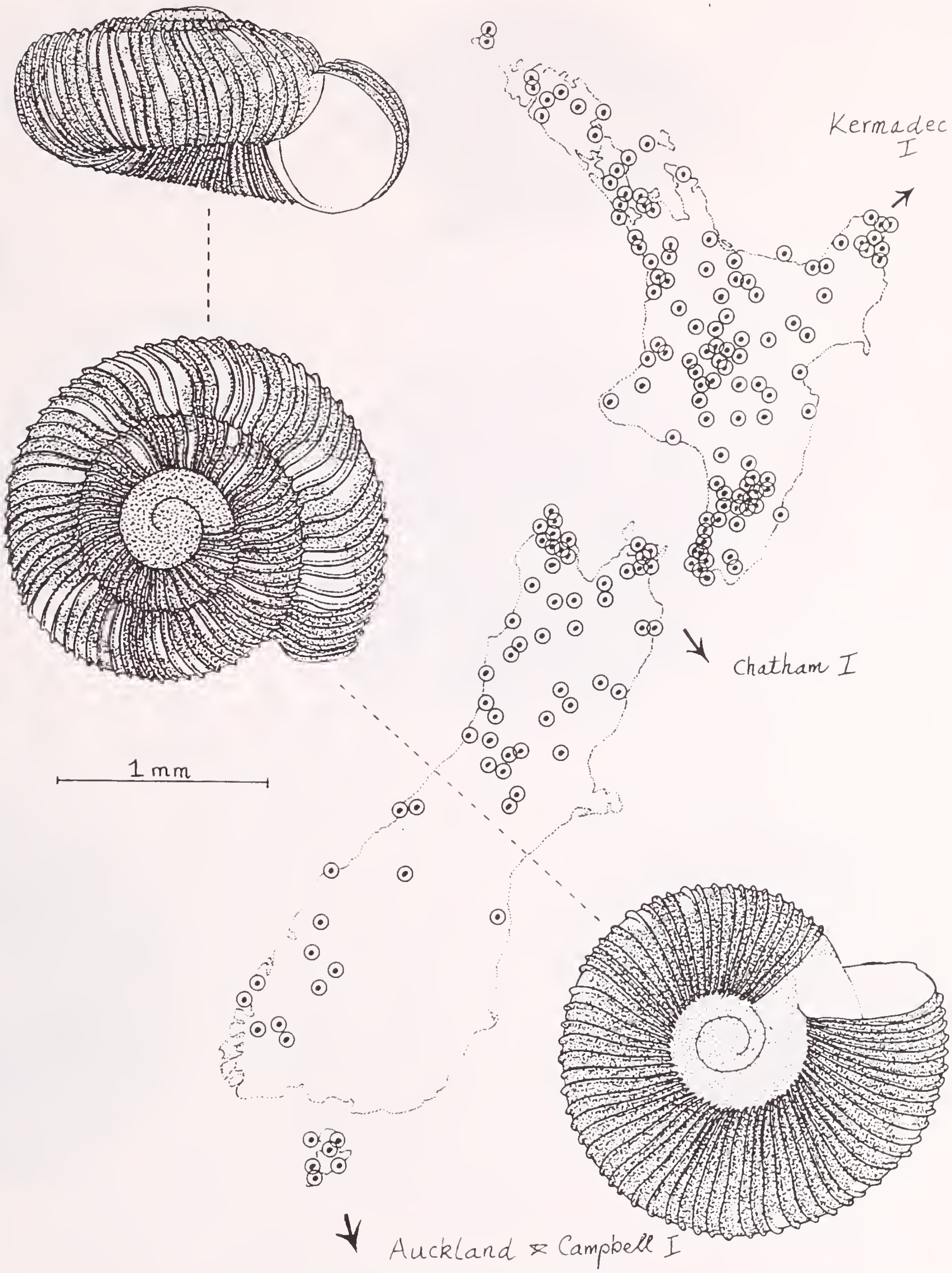


Fig.3 Shell and locality records of *Phenacharopa* n.sp.1 (black circles), *P.novoseelandica* (open circles) and *P.* n.sp.2 (black and white circles)

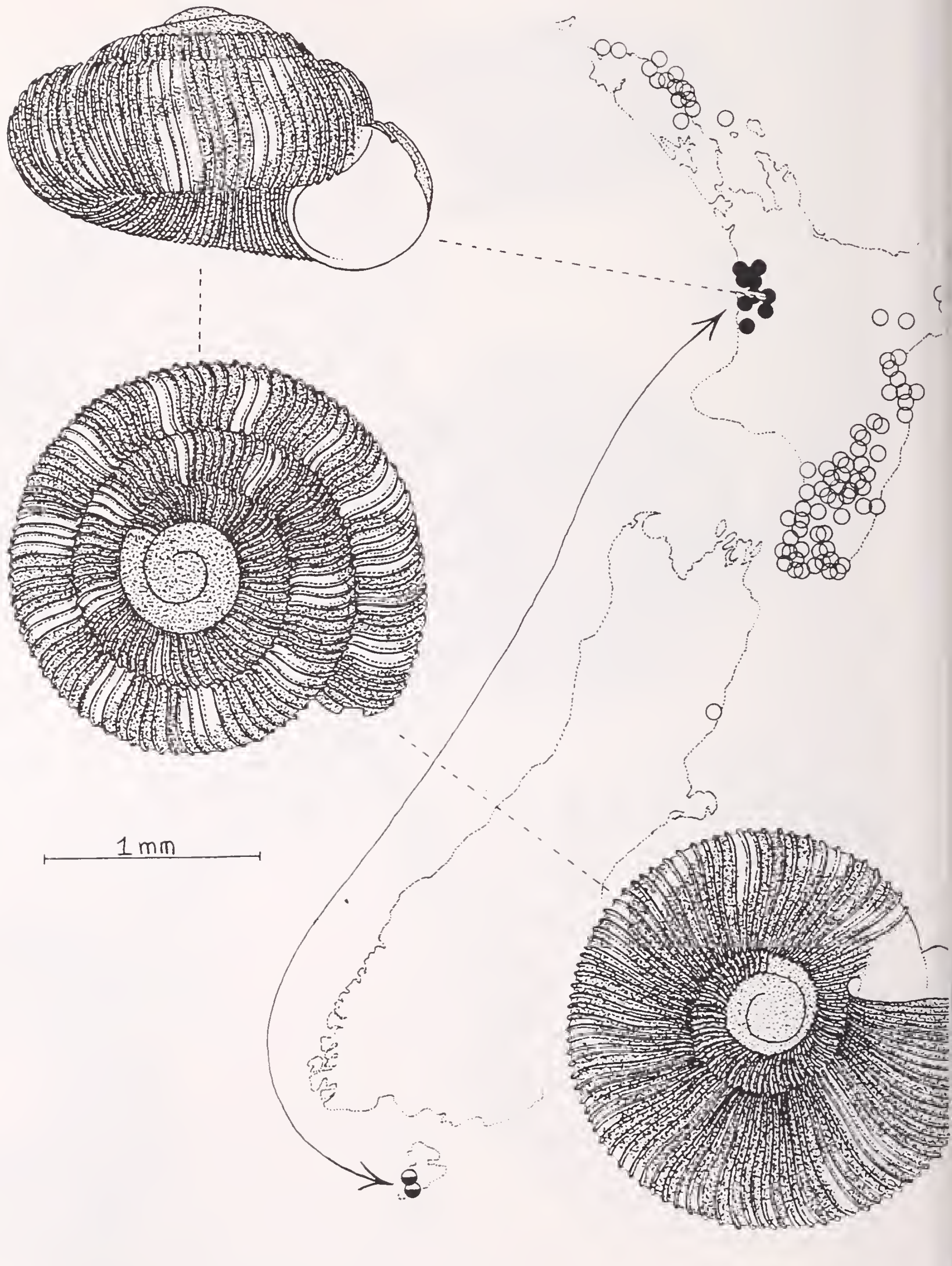


Fig.4 Shell and locality records of *Phenacharopa* n.sp.2 (black and white circles) *P.novoseelandica* (open circles) and *P.* n.sp.1 (black circles)

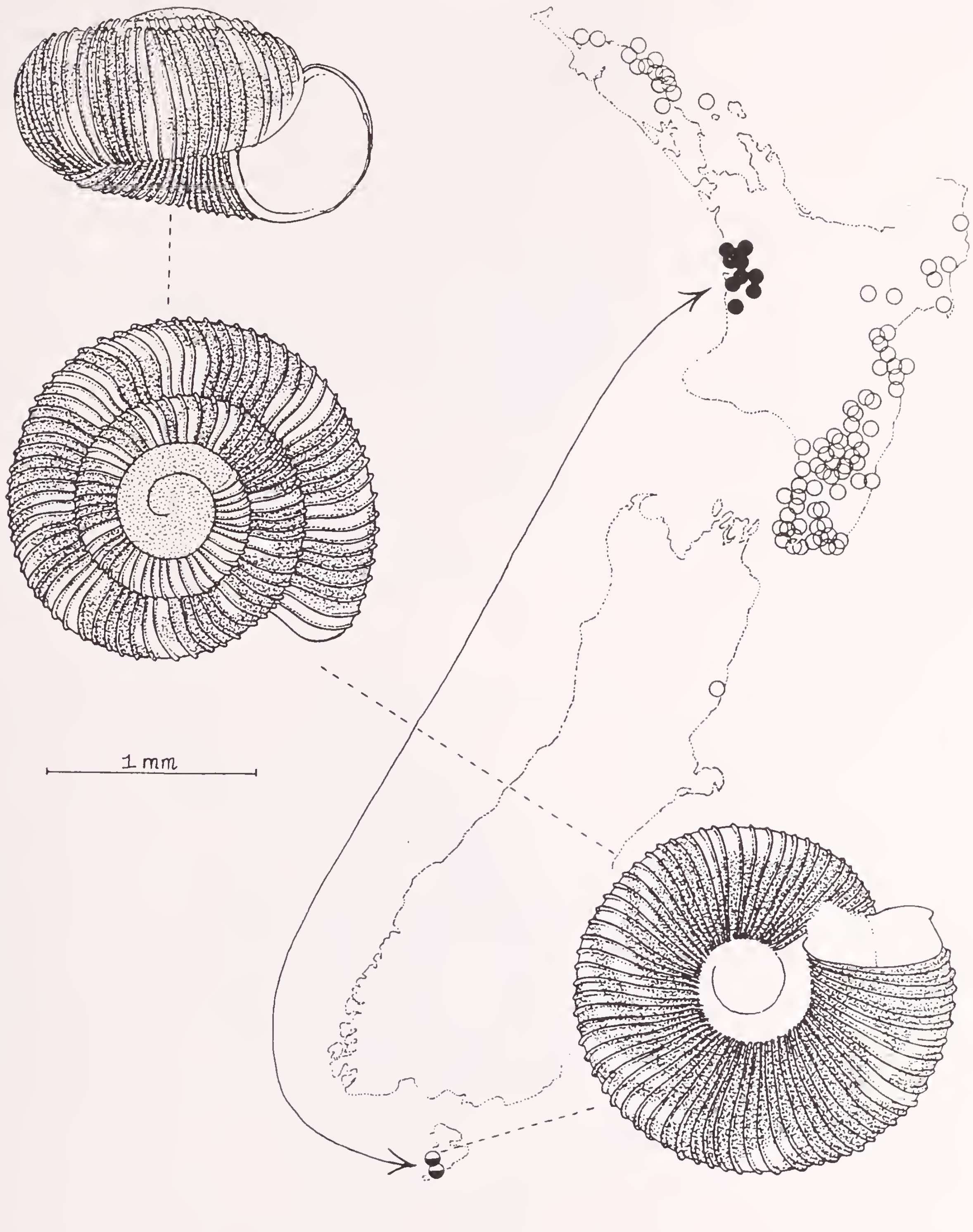


Fig.5 Summary of the distribution of *Phenacharopa* species: stippled line, *Phnacharopa pseudanguicula*; hatched line, *P.novoseelandica*; dashed line, *P*.n.spp.1 & 2; 1, Three Kings Islands; 2, Raoul Island; 3, Chatham Islands; 4, Auckland Island; 5, Campbell Island

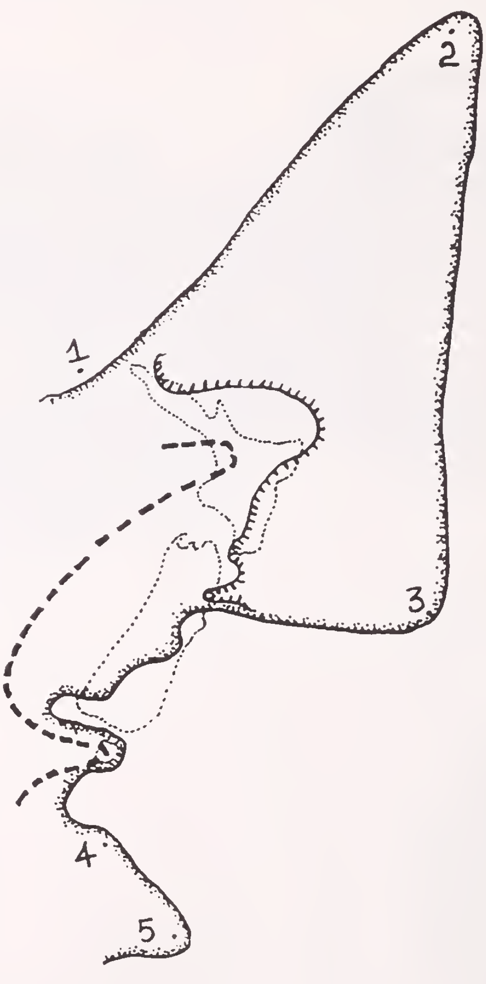
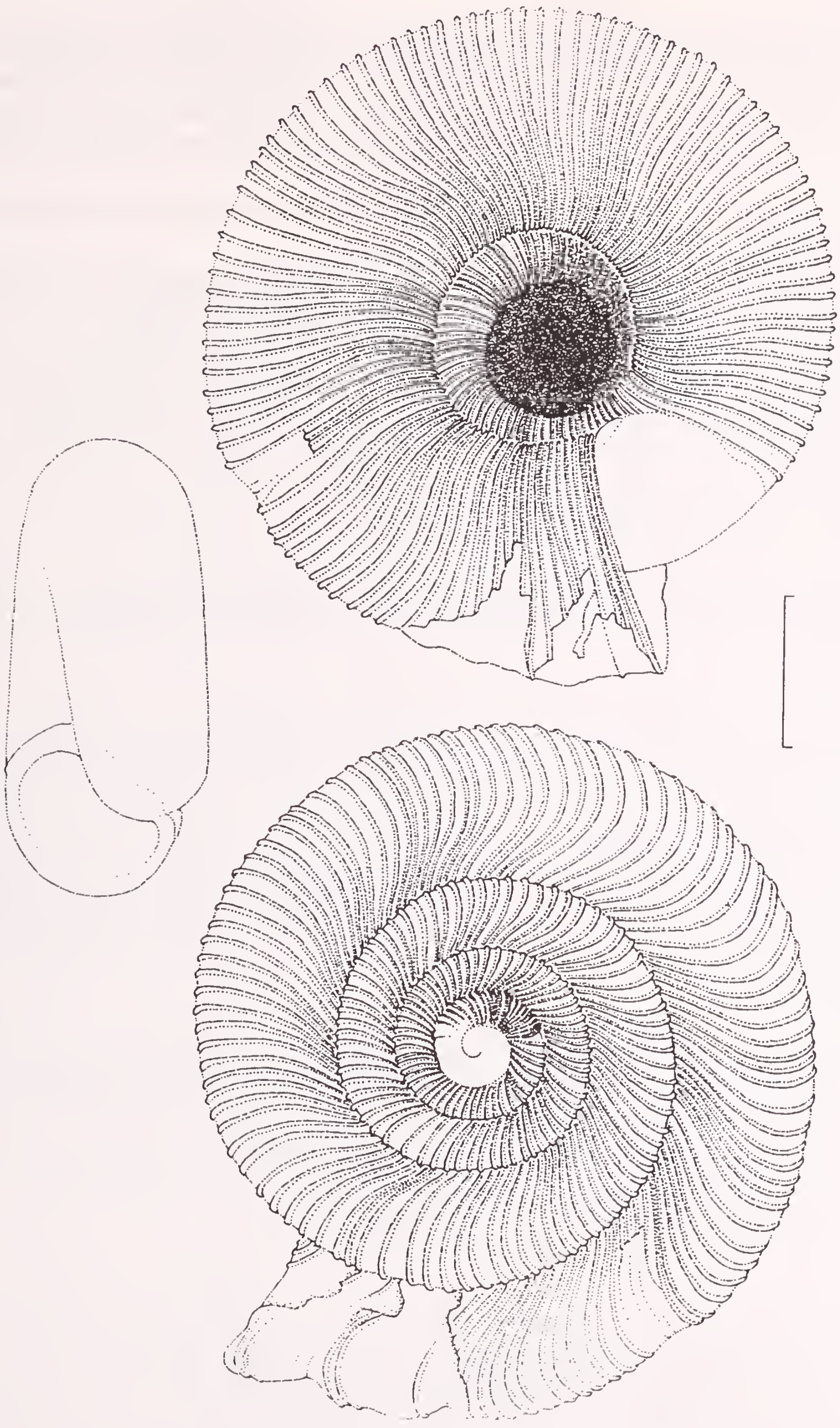


Fig.6 Lectotype, *Helix anguicula* Reeve,1852, British Museum (Natural History)
Scale line 1mm



The CITES Agreement

New Zealand belongs to the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), one of over 100 member countries. An act was passed in 1989 in New Zealand called the Trade in Endangered Species Act which prohibits the import or export of listed animals, plants and their products except with a special permit.

This affects us as shell collectors, there being a ban now on trade in several families and species, listed as follows:
Achatinellidae - All species of *Achatinella*, especially *Achatina fulica*, the South African land snail which is now ravaging many of the Pacific Islands.
Unionidae - All species of fresh water mussel both here and overseas.
Camaenidae - *Papustyla pulcherrima* the Manus Island green tree snail.
Paryphantidae - All species of New Zealand *Paryphanta*, our Kauri snail.
Placostylus - It is now illegal to collect these dead or alive in New Zealand.
Tridacnidae - All species of the giant clam including *Hippopus*
Corals - *Hydrozoa, Alcyonaria* and *Anthozoa.*

For those of us who like to shell overseas, many countries are putting restrictions on the collecting of shells. In the Seychelles and now in Mauritius, collecting has been banned altogether.

In Queensland, Australia, 98% of the Great Barrier Reef is now a Marine Park and has restrictions placed on it with limited collecting in some areas and many areas needing a permit. Other States are following suit. West Australia is creating new maritime parks where collecting is not allowed and there are also restrictions in South Australia. Victoria allows the taking of minimal numbers of marine molluscs in most places and in restricted areas by members of thePort Phillip Bay Shell Club which is covered by a permit for collection by hand only. "Limited collecting" is the taking of not more than five individuals of any unprotected species in any 28 day period, and shells must be collected by hand.

Collection of the helmet shell, *Cassis cornuta*, the triton shell,*Charonia tritonis*, and shells with eggs is prohibited anywhere. Some shells have minimum size limits such as:

Turbo marmoratus - minimum weight 280g
Pinctada maxima - minimum 16cm overall and 12.5cm at base
Crassostrea commercialis - minimum 5cm
Trochus niloticus - minimum 6cm at base

Donax deltoides has a closed season in South Australia between 1 June and 31 October.

Each state manages its own coastline and makes its own laws governing the collection and trading of shells. In South Australia recently a man was fined $A1100 and his shells confiscated for swapping with collectors in U.S.A. and Queensland. According to the Fisheries Department "exchanging is selling" and he did not have a permit for that. It was a test case and he was lucky as he could have been fined $A16000 or have been jailed for eight years.

ODE TO THE MOLLUSC

CARTON COFFINS FULL OF SHELLS
EACH SPECIMEN A STORY TELLS
SELECTED INDIVIDUALLY BY OTHERS
MALACOLOGY COLLEAGUES AND SHELL LOVERS
DEDICATED TO THE CAUSE
EACH BEACHWALK AND TRAWL, PAUSED
TO PICK THE GEM COLLECTED HERE
THAT IT MIGHT SURVIVE WITH CARE
AND BE LARGELY RESEARCH USED
EACH FAMILY DULY PERUSED
THAT OTHERS MIGHT KNOW
THE DIFFERENCE THAT IS SO.
BEAUTY AND COLOUR GLEAM
FROM SHAPES AS WEIRD AS ANY SEEN
COMPACTED IN NUMBERED GRAVES
FAR FROM SURGING WAVES
AND SHIFTING BENTHIC SAND
ARE MOLLUSCS CAPTURED ON THE LAND
AND LOCKED IN ROCK MILLENNIA OLD;
FOSSILS LONG DEAD LAID OUT COLD.
ACCESSIONED, NOW INERT THEY LAY
AWAITING RESSURECTION DAY!

MICHAEL K. EAGLE

POIRIERIA

Auckland Museum
Conchology Section

Volume 16, No.6, January 1994

ISSN 0032-2377

Contents:

From the Editor:

Dear Members,

I feel somewhat dishonest in assuming the title "editor", especially when I look over the impressive copies of "Poirieria" produced by past editors. My role will be more that of co-ordinator or compiler, and as such I will rely on your assistance and good will.

I am fortunate to have the support of Margaret Morley in the production of the Journal, and I will be calling on the generosity of various "experts" in the club to help me with the editorial process.

This edition is on landsnails. Two articles that have been awaiting publication for some time. The content of "Poirieria" will directly reflect the enthusiasm and dedication of the contributors. At present it seems we have some devoted enthusiasts of landsnails producing very worthwhile material. If you find the content of the Journal lacking in any aspect of conchology, I can only suggest that you put fingers to computer and produce the balance!

We are aware that members often publish in other publications. Occasionally we will reprint these articles when they are particularly relevant to New Zealand. We would like to produce, regularly, a bibliography of members publications and as a start, I have compiled a list of publications by members of the Museum staff for this edition. I cannot list what I do not know! Please, if you publish anything at all anywhere else, send me a photocopy or just the name, author, date, and publication. This information can be very important in keeping up to date with taxonomy, detecting the presence of "new imports" etc.

As we have access to computer and laser printer, your contribution can now be submitted on disc. Manuscripts clearly typed and ready for copying are most gratefully received! The submission of handwritten articles should be discussed with Margaret Morley or myself.

I would like to express my thanks to Auckland Museum and Lorien Stace for their support with the photocopying of this edition.

The next edition is already under way, with a major article by Margaret Morley on the molluscan fauna of the Subantarctic Islands. Please keep the contributions rolling in.

Glenys Stace

Editor's Note:

Our small operculate land snails of the genus *Cytora* have received little attention lately. They are, however, quite an interesting group and not at all difficult to locate in bush leaf litter.
We have decided to include in this issue a paper on their distribution which was actually written some time ago. At that time a few copies were made available to interested collectors. Since then several additional new species have been located and now await formal description.

A DISTRIBUTIONAL GUIDE TO THE NEW ZEALAND OPERCULATE LANDSNAIL GENUS CYTORA KOBELT & MOELLENDORFF 1897.

N. W. Gardner.

Abstract.

A distributional pattern for each of the named species is presented.
Affinities between certain species is discussed and the occurrence of some regional forms noted.
All the recognised species are figured.
Specimens in excess of 150 locality lots have been used in this survey.

Introduction.

The Genus Cytora Kobelt and Moellendorff 1897 is included in the endemic New Zealand Cyclophoracean Family LIAREIDAE.
The relationship of this family to the small operculates occurring to the north of New Zealand has not been fully investigated.
These small operculate landsnails, which seldom exceed 5.0 mm. occur quite commonly in most bush-clad areas where they live amongst leaf litter on the bush floor and on low vegetation especially near the scrubby edges.

Most species have moderately high spire and a tight fitting operculum, are generally a dark brown colour without colour markings, but in a few species there is sometimes a lighter peripheral spiral band. Many exhibit distinctive sculpture over the later whorls and this, together with the profile outlines, seems quite adequate for identification without recourse to radular details which are often surprisingly similar in obviously different species. Such has also been noted in the other genus of the family.

The maximum development of the Cytorids have taken place in Northland and Three Kings Islands where sixteen of the twenty-two named species are known to occur. Southwards the number decreases, until at the south of the South Island and at Stewart Island only a single species in known to be present.

While the distributional ranges of the more recently described species are quite well known, those of the species named during the latter part of last century are poorly defined with no distributional data readily available. This paper sets out the presently known range of these species.

The listed species are not set out in alphabetical order, but are grouped together where there are common features.....

Distribution Key.

Area.	Species present.	Page.
Three Kings Island:	Cytora annectens (Powell).	21
	filicosta (Powell).	22
	hirsutissma (Powell).	24
	kaima Climo.	23
	solitaria (Powell).	23
Northern Block. Cape Reinga to North Cape:	ampla (Powell).	6
	hispida Gardner.	8
	kerrana Gardner.	11
	tepakiensis Gardner.	13
North Auckland Peninsula. Mt. Camel to Auckland:	aranea (Powell).	7
	cytora (Gray)	5
	fasciata (Suter).	10
	pallida (Hutton).	9
	septentrionale (Suter).	12
	torquilla (Suter).	16
	hedleyi (Suter).	13
North Island. South of Auckland:	chiltoni (Suter).	14
	cytora (Gray).	5
	fasciata (Suter).	10
	hedleyi (Suter).	13
	lignaria (Pfr.).	17
	pallida (Hutton).	9
	torquilla (Suter).	16
South Island:	calva (Hutton) ?	20
	chiltoni (Suter).	14
	depressa Gardner.	18
	lignaria (Pfr.).	17
	pannosa (Hutton).	19
Stewart Island :	chiltoni (Suter).	14

To assist with the identifaction of the different species the following key is provided:

A. Shell without membranous processes;
or with growth lines only.......... Cytora ampla (Powell).
calva (Hutton).

B. Shell with membranous processes:

1. Riblets fairly evenly spaced.... annectens (Powell).
aranea (Powell).
depressa Gardner.
filicosta Powell.
lignaria (Pfr.).
solitaria (Powell).

2. Riblets irregularly spaced, ragged.Definite spiral striae..... chiltoni (Suter).
fasciata (Suter).
hedleyi (Suter).
pallida (Hutton).
pannosa (Hutton).
septentrionale (Suter).
tepakiensis Gardner.
torquilla (SuterO.

3. Membranous processes terminating in bristles....... cytora (Gray).
hispida Gardner.
hirsutissma (Powell).
kerrana Gardner.

7.

CYCLOPHORIDAE.

Family LIAREIDAE Powell 1946.

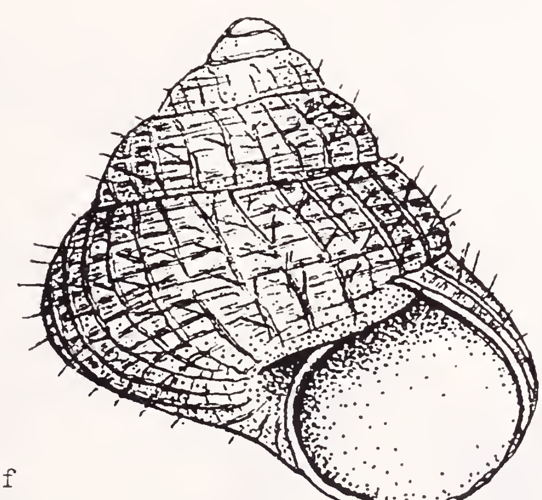
Genus Cytora Kobelt and Moellendorff 1897.

Type species: Cyclophora cytora Gray 1850.

Cytora cytora (Gray 1850).

= 1849 Cyclophora Cytora Gray. P.Z.S.(1850).167.
1893 Logochilus cytora (Gray) Hedley and Suter P.L.S. N.S.W. (2) vii, 621.
1936 Murdochia cytora (Gray) Powell: The Shellfish of New Zealand p69.

Shell small, turbinate, horny to light brown. Spire convex a little more than the height of aperture. Protoconch of two whorls, smooth at first but the last half whorl with fine axials. Whorls evenly rounded. suture impressed. Sculpture consists of distinct rounded spiral threads, some seven on the penultimate and approximately twenty on the body whorl. These are crossed by oblique subequidistant membranous riblets:



At the points of intersection short epidermal hairs arise.

Aperture nearly circular. Peristome simple but thickened internally .

Columella short, oblique. partly covering the narrow umbilicus

Diameter 2.5 mm   Height 2.0 mm.

Holotype: British Museum .

Type locality: 'Auckland'.

Distribution: From Kaitaia in Northland to the central Plateau of the North Island.

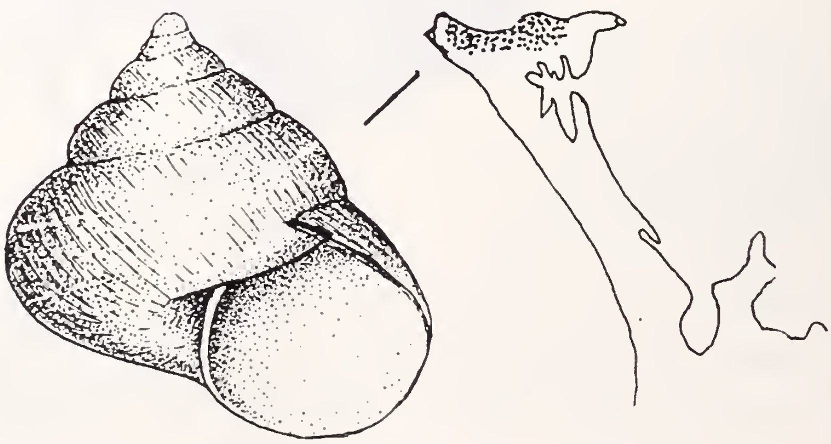
Some selected locality reoords: Okaihau -1-64; Kaiangaroa , Northland -1-69; Waipoua -1-68; Paparoa -168; Mangawai -3-65; Swanson -3-68; Waiheke Island-10-66; Great Barrier Island, G.Mitchener -8-68; Thames -5-53; Raglan -10-67; Mamuku -2-63; Pirongia -10-67; Waikaremoana -2-63; Cape Runaway -1-49; Waioweka -2-57; Desert Road -11-70 S. Turner. (Material collected by the writer unless otherwise stated).

Remarks: A relatively plentiful species. Profile and sculpture remakably constant in the localities checked.

Cytora ampla (Powell1941).

1941 Murdochia ampla Powell. Rec. Auck. Inst. Mus. Vol.2. No. 5, p. 260 pl. 51, fig. 10.

Shell large for genus, trochiform, with outlines of whorls and base evenly rounded. Spire a little more than the height of aperture. Six whorls, including a slightly bulbous pitted protoconch of two whorls. Sculpture consisting of only fine growth lines, sometimes there are a few heavier ones at irregular intervals. Aperture almost circular withthe peristome continued



as a callous across the parietal wall. Umbilicus open. Shell uniform dull reddish brown or with a varied number of lighter coloured spiral bands around the body whorl.

Diameter 6 mm Height 6.mm.

Holotype: Auckland Institute and Museum.

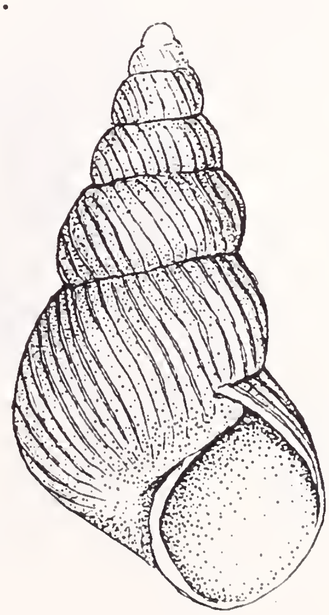
Type locality; Unuwhao 800-900'. Between Spirits Bay and Tom Bowling Bay.

Additional records: Pandora -1-47; Kahuroanaki -1-66; Taputaputa -8-65; Cape Maria (Subrecent).-1-61.

Remarks: Cytora ampla is restricted to the Cape Maria - North Cape area of the North Island. This a reasonbly common snail in the bush remnants on the higher ridges. It is also known to occur in subrecent condition in the consolidated dunes at Cape Maria. Such examples do not approach the size of recent specimens; are less globose and have the remains of a few spirals around the body whorl in the same position as the light coloured spiral bands in some recent specimens.

Cytora aranea (Powell 1928).

1928 Murdochia aranea Powell Trans. Proc. N.Z. Inst. Vol. 59 p. 365, pl. 54 fig. 1.



Shell small, thin and fragile with a high spire of about two and a half times height of aperture . Six whorls, with a protoconch of two smooth whorls. Sculpture consists of membranous obliquely retractive axial riblets, ten to twelve per mm. which continue around onto the base. Peristome discontinuous and the umbilical perforation narrow . Shell dark brown.

Height 3.0 mm Diameter 1.5 mm.

Holotype : Auckland Institute and Museum.

Type locality: Opononi, Hokianga Harbour.

Material examined: Herekino Gorge -9-61; near Lake Ohia Monganui, A.E.Brookes Coll.; Waima -1-68 Waipoua Forest -1-68.

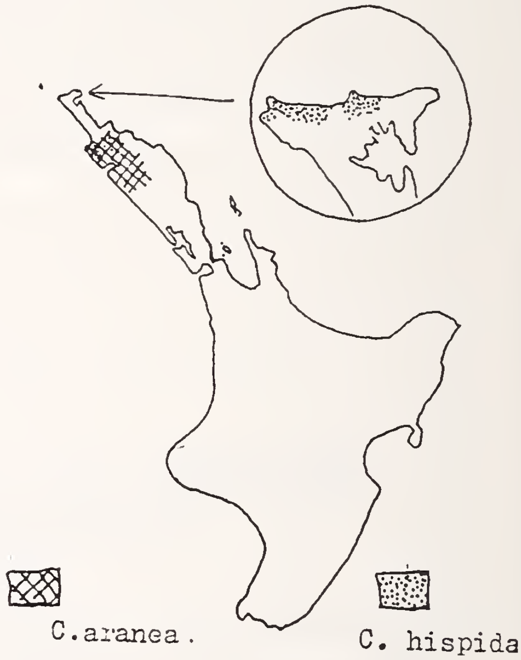
Remarks: Known distribution - Herekino to Waipoua forest, western area.

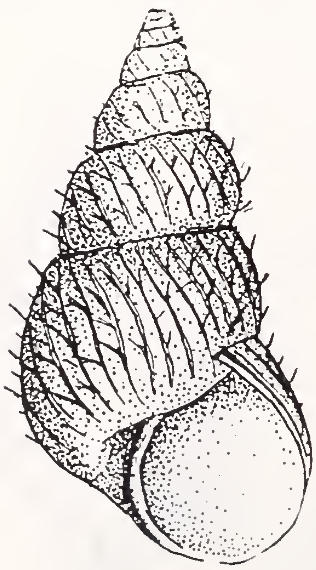
Specimens from the southern limits are consistantly larger with a taller spire.

<u>Cytora hispida</u> Gardner 1967.

1967 Cytora hispida Gardner Trans. Roy. Soc. N.Z. Zoo. Vol.8, p215. pl. 1, fig.1.

Shell small, reddish, of six whorls including a protoconch of two smooth whorls. Spire a little more than twice the height of aperture, outlines convex. Sculpture consists of strong oblique retractive membranous riblets running from suture to suture and to the umbilical region. These riblets spaced at seven to nine





per mm. are produced into hair-like processes - up to four per riblet on the penultimate and eight on the body whorl. the hairs are erect and inclin - ed somewhat towards the apex of shell. Interstices weakly punctate.

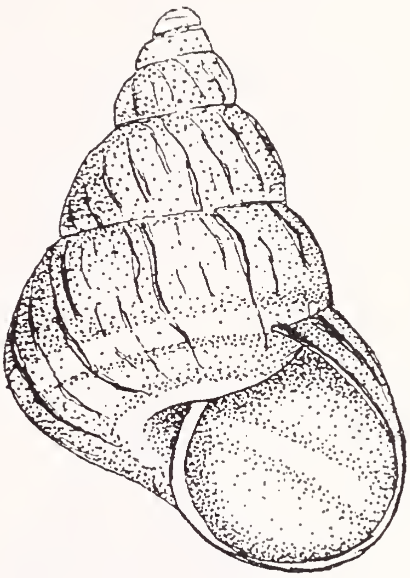
Suture impressed, outer lip evenly rounded.

Height 3.5 mm Diameter 1.75mm .
Holotype: Auckland Institute and Museum.
Type locality: Taputaputa Bay, in small bush remnant, Cape Reinga.
Also recorded from Pandora -1-65; Waterfall Gully, Spirits Bay -1-65: Kahuroanaki -4-65: Te Werahi (Subrecent) -4-65.

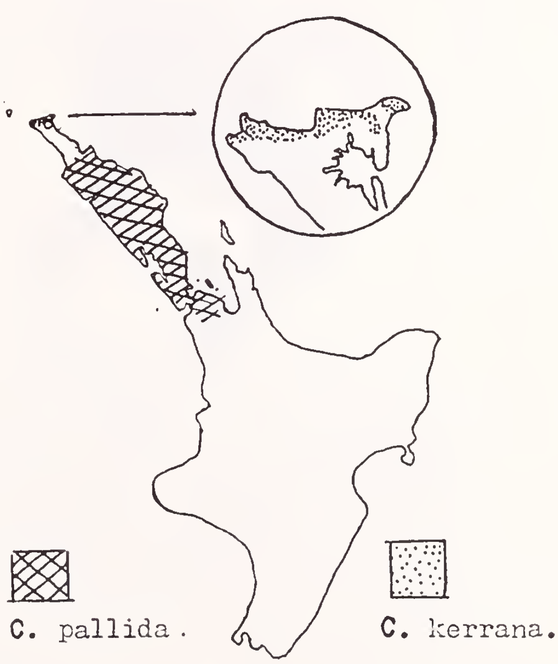
<u>Cytora pallida</u> (Hutton)

1883 <u>Leptopoma pallida</u> Hutton. N.Z.J.S. i, 447.

1884 <u>Lagochilus pallida</u> Hutton T.N.Z.I. xvi, 184-210.



Shell small, conical, pale brown. Sculpture consisting of rather distant irregular weak spirals, two or three on the upper whorls and about about five on the base. These are crossed by fine oblique growth lines and distant membranous plaits which are often rubbed off in adult shells. Sometimes there is a pale band at the periphery. Five and a half whorls, the last sub-angled at the periphery.
Height 5.0 mm. Diameter 3.25 mm.
Holotype: Canterbury Museum.
Type locality: 'Auckland'.
Distribution: <u>Cytora pallida</u> is dispersed over all the North Auckland Peninsula except for the Northern Block (Cape Reinga - North Cape) which is occupied by a related species.
It has been recorded from Hunua and Waiuku, but south of Auckland it is uncommon.

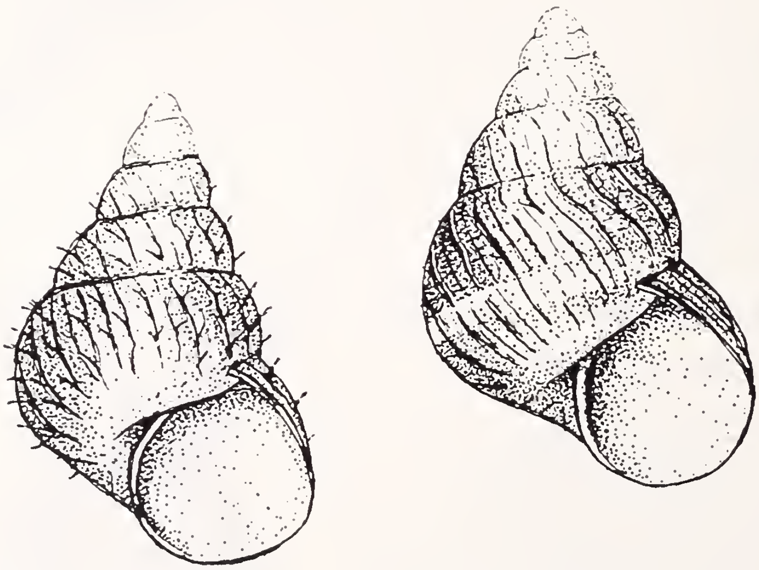


Some selected locality records: Larmers Rd., Kaitaia -9-62; Maungamuka Gorge -1-65; Okaihau -1-65; Waipoua forest -1-68; Whangarei-1-68: Cavalli Islands, E. Milligan 1955; Waiwera -11-47; Greenhithe -8-47; Titirangi -8-65; Hunua, J.Goulstone Waiuku N.Douglas.

Cytora kerrana Gardner. 1967.

1967 Cytora kerrana Gardner. Trand Roy. Soc. N.Z. Vol. 10 No. 17, pp159-162.

Shell small. Spire one and a half times height of aperture, outlines convex. Sculpture consists of oblique, rather straight riblets running from suture to suture and onto base. These membranous riblets, spaced at six or seven per mm. are produced into hairlike processes at irregular intervals. Although well represented on juvenile and sub-adult specimens. they are often worn off mature shells. Interstices with fine growth lines on a pitted surface. Spiral threads are sometimes present. Shell is



a reddish brown with a pale band at the periphery.

Height 3.25 mm. Diameter 2.0 mm.

Holotype: Auckland Institute and Museum.

Type locality: Coastal cliff, Kerr Point near Nort Cape.

Also recorded from Whareana -1-66; Taputaputa -4-66; Kahuroanaki -1-66; Pandora -1-66. Te Werahi (Subrecent).

This species, which is restricted to the Far North, is undoubtedly related to pallida but differs in having more regular and distinct axial ribbing with the addition of erect hair-like processes. It is also of smaller size.

Cytora fasciata (Suter).

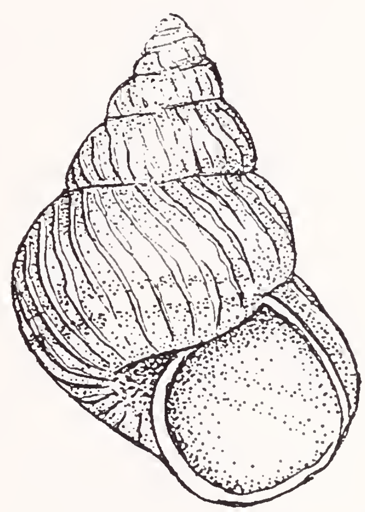
1894 Lagochilus fasciatum Suter. T.N.Z.I. Vol. 26. p132, pl.19. fig. 30,31.

Shell small, turbinate, rufus, thin. Sculpture consists of thin close membranous axial plaits, often produced at the sutures and spaced at about 11 or twelve per mm. on the last whorl. Interstices with fine distinct spiral striae. Most specimens have a pale band around the periphery. Suture impressed.

Height 2.5 mm. Diameter 2.0 mm.

Type : Suter Coll. National Museum.

Type locality : Near Mania, Waimate Plains.



Remarks: The only published locality record appears to be that cited in the type description.This undoubtedly refers to a south Taranaki location. The use of name Waimate Plains seems to have been discontinued many years ago. Specimens collected at several stations in Taranaki match quite closely the dimensions of the type specimen as given by Suter but the riblet count is at variance. In series of specimens the average was 8 per mm. while that for the holotype is stated to be 11 to 12.

Specimens of similar size and riblet count, referrable to fasciata occur in Northland from Waipoua to Kaiangaroa near Kaitaia with an isolated occurrance on Mt. Camel of a form a little larger in size and with wider spaced ribbing.

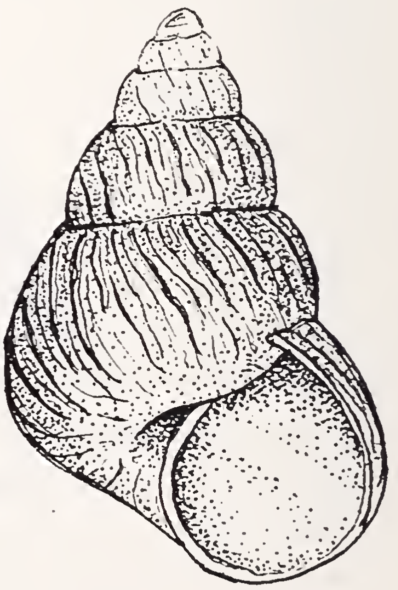
This species is relativel common around Inglewood and Mt. Messenger and in the north around Waipoua but there no records from between.

A new undescribed species with distinctive even sculpture and possibly having a common ancestery with the fasciata complex occupies territory embracing the southern sector of Waipoua forest, Maungamuka Gorge and Kaeo.

Cytora septentrionale (Suter 1907)

1907 Lagochilus chiltoni septentrionale Suter
P. Mal. S. VII, 238, pl. 22, fig. 9.

Shell small, turbinate convex whorls and fairly deep sutures. Colour dark brown. Sculpture consists of very irregularly spaced and ragged membranous riblets of uneven strength spaced at about 10 per mm on the body whorls. There are low rounded microscopic spirals over all whorls but sometimes these are indistinct. There is usually a paler peripheral band.



Height 3.5 mm Diameter 2.5 mm.
Type : Suter Coll. National Museum.
Type locality: Cowes,Waiheke Island.
Other records: Waipoua Forest -4-55; Waipu -9-66; Mahinepua -3-67; Hunua -5-66; Mangatawhiri,J. Goulstone; Kaimai Range, A. E. Brookes Coll.

Remarks: While septentrionale could not be located on Waiheke Island it does occur not uncommonly in the Hunua Range which is directly opposite on the mainland. Specimens from here are quite typical.
Apart from its greater size, this species has a very similar fascies to the fasciata complex - the same ragged sculpture, the presence of spirals and the peripheral banding. It may be that septentrionale

belongs in this complex which would then extend from Taranaki to the Far North if the following species is included.

Cytora tepakiensis Gardner 1967.

1967 Cytora tepakiensis Gardner. Trans. Roy. Soc. N.Z. Vol. 8. No 21, pp215-220.

Shell small, dark brown, shiny.Spire twice the height of aperture. Sculpture is of irregular, oblique silky riblets some 12 to 14 per mm.on the body whorl and running from suture to suture. Some riblets become thickened and lammellose at the suture where they bridge the whorls with a plate-like process .

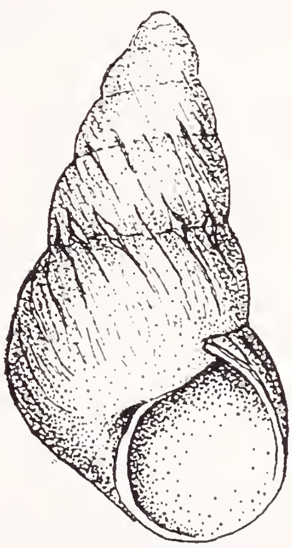
Height 3.75.. Diameter 2.0 mm

Holotype: Auckland Institute and Museum.

Type locality: Taputaputa, near Cape Reinga.

Other records: Pandora -1-65; Kahuroanaki-4-65. Waterfall Gully, Spirits Bay -1-65. Whareana, near North Cape. -1-66.

Remarks: This species is restricted to the Northern Block (Cape Reinga - North Cape). The membranous processes and spiral striae suggest a relationship to the fasciata group .



Cytora hedleyi (Suter)

1894 Lagochilus hedleyi Suter. P.L.S. N.S.W. (2) viii, 484. pl.22. fig.1,1a.

Shell very small, turbinate, rather thin, rufus and sometimes paler. Sculpture consists of white membranaceous axial riblets, close together on the penultimate whorl but gradually becoming

distant towards the aperture where they are about 9 per mm. Fine spiral striae between the riblets. Whorls rounded, the last rapidly increasing. Suture deep. Umbilicus narrow, and partly hidden by the inner lip. Spire a little higher than height of aperture

Height 2.5 mm   Diameter 2.0 mm

Type: Suter Collection, National Museum.

Type locality: Hunua Range .

Selected locality records: Kaeo -7-65; Kaiwaka -10-66: Warkworth -6-67; Titirangi -7-66; Clevedon -6-66; Thames -5-53 H.E.Whitten; Mamuku -10-56 I. Townsend: Mt. Pirongia; Raglan -10-67.

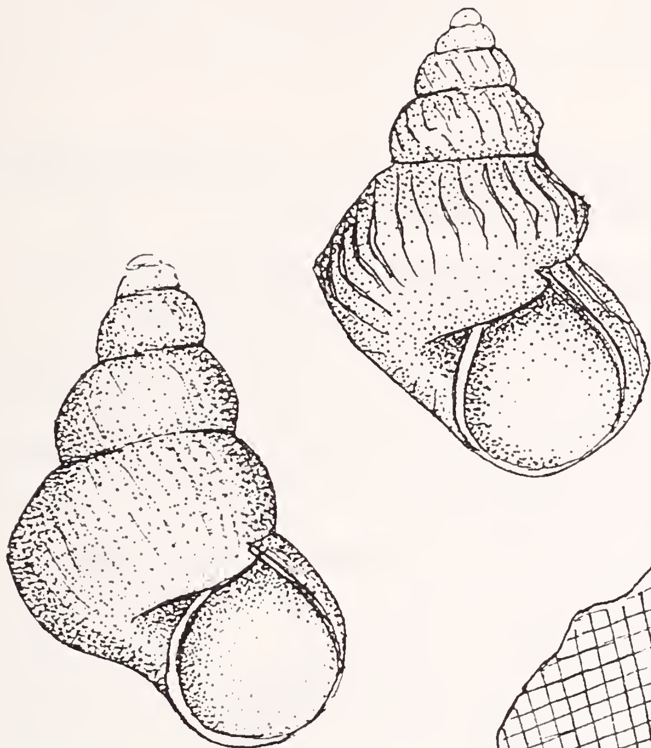
Remarks: Fairly constant over its entire known range which extends from Kaitaia to the Waikato .

Cytora chiltoni (Suter 1896)

1896 Lagochilus chiltoni Suter. Proc. Mal. Soc. ii, 33, pl.4.

Shell very small, turbinate, pale to dark rufus. Spire one and a half times height of aperture. Post embryonic whorls with fine close even ribbing. Six whorls, evenly rounded, sutures deep. Principle sculpture consists of nearly equidistant axial riblets at 4 to 6 per mm. (often worn away on adult shells). When processes are in good condition they are raised and wing-like at the periphery There are fine growth lines and faint microscopic spirals between

the riblets. Umbilicus narrow, open.
Height 3.0 mm. Diameter 2.5..
Holotype: Suter Collection, National Museum.



Remarks and distribution: C. chiltoni has a widespread distribution over most of the South Island, Stewart Island and much of the North Island apart from the North Auckland Peninsula . It is a variable species which has produced a number of forms, the most notable being the dark squat one with strong peripheral processes which occurs in North Taranaki and the King Country. The northermost record we have for this species is the Hunua Range where it is quite uncommon. From the central Plateau northwards, chiltoni occurs together with C.torquilla, a species of rather similar profile.

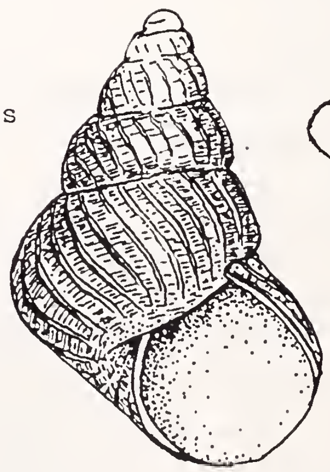
Selected locality records: Stewart Island -11-47; Tuatapere Lake Hauroko -3-77; Resolution Island -2-75; Signal Hill, Dunedin,

Waimate -1-70; Waoroa Gorge, Nelson -1-70; Takaka Hill -1-70; Patarau -1-70. North Island: Owhango -12-65; Waikaremoana -3-63, Mamuku -12-65; Awakino Gorge -1-67; Maungatawhiri, J. Goulstone.

<u>Cytora torquilla</u> (Suter).

1894 <u>Lagochilus torquilla</u> Suter. P.L.S. N.S.W. (2) V111 485 pl. 22 fig. 2.

Shell minute, conical, subperforate, thin and fragile, Sculpture consists of close whitish membranous, oblique radiate riblets directed slightly backwards; there are about 15 per mm on the last whorl. Interstices microscopically spirally striate, more distinct on base. Uniform rufus colour but sometimes with a pale band at the periphery. Epidermis thin, not shiny.
Spire higher than aperture: Suture deep, whorls evenly rounded.
Height 1.75 mm Diameter 1.25 mm.
Holotype: Suter Collection
National Museum.
Type locality : Howick,
Auckland.
Some selected locality records;
Kaiangaroa, Northland -1-65;
Kaeo -1-65; Okaihau -1-65;
Aorangi Id, Poor Knights Islands
-1-65; Hen Island, A.E.Brookes
Coll.; Great Barrier Island,
Mitchener ; Birkenhead -3-67;
Thames , H.E.Whitten -5-57;
Rotorua, A.E.BrookesColl.;
Kaimai -10-56; Waituhi -3-47;
Raglan -10-67; Awakino -6-67;
Records by writer unless
otherwise stated.



Remarks: Somewhat similar to the preceeding species, but has a taller spire, closer riblets and more definite spiral sculpture.

This very small species is relatively common north of Auckland to Kaitaia but less so to the south. It is prolific species on most off-shore islands along the east coast north of Auckland. An interesting form occurs in the Merita area of Doubtless Bay. This has a malleated surface with raised wing-like axial riblets.

Cytora lignaria (Pfr.).

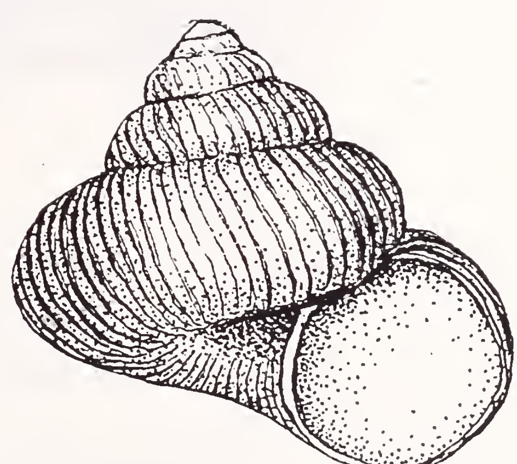
1857 Cyclostoma lignarium Pfieffer. P.L.S. 112.
Lagochilus lignarium(Pfr.): Hedley and Suter . P.L.S. N.S.W. (2) vii 621.

Shell small, umbilicated, turbinate, rufus to light browm. Sculpture consists of irregular membranous axial riblets spaced at about 8 per mm. extending from suture around to the umbilicus.These raised riblets are directed backwards with the free edge being irregularly serrated. On most specimens there is weak spiral sculpture. There are five evenly rounded whorls with a spire about the same height as aperture. Suture well impressed . Umbilicus deep, open, one sixth diameter of shell. On most mature shells the processes have flaked off.

Height 4.0 mm. Diameter 5.0 mm.

Holotype: British Museum.

Some locality records:
Kaihinu, Townsend -4-58;
Levin -12-52; Wiltons Bush Wellington; R.K.Dell;
Akatarawa -5-65; Rimutaka Range, Townsend; Pelorus Bridge -1-67;
Whangamoa Saddle -1-67; Blumine Id., G. Foreman -1-78; Puponga,F.M.Climo, -4-62;



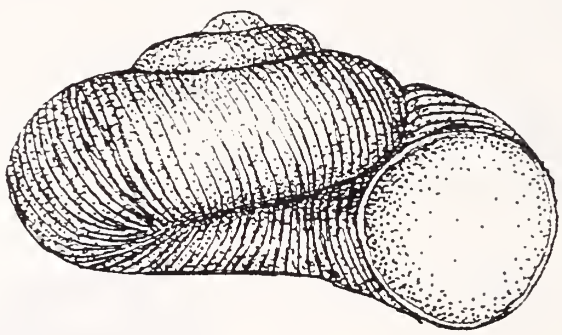
Remarks : Suters statement that there are no spirals is not quite correct. Specimens from the Wellington to Kaihinu area tend to have weak spirals which are more noticeable on the base of shell. The distributional range of this species is from the

C. lignaria has one distinctive form from around Karamea and Rapahoe north of Greymouth. This is taller with a sub-angled body whorl and a smaller umbilicus. The riblets are very irregular and ragged and are spaced at approximately 4 per mm. Spirals are more evident on the body whorl.

Cytora depressa Gardner. 1968.

1968 Cytora depressa Gardner. Trans. Roy. Soc. N.Z. Vol. 10. No 17, pp 139-162, 1pl.

Shell small, depressed turbiniform, four whorls, dark brown with a shiny appearance. Spire two thirds height of aperture. Sculpture consists of fine threadlike riblets some twelve per mm. running from suture to suture and around the body whorl to umbilicus. Interstices with fine growth lines only.



Peristome continuous, thickened and a little reflexed; inner lip appears to be almost detached from parietal wall. Umbilicus one third diameter of shell, perspective and clearly showing the previous whorls.

Height 2.5 mm.   Diameter 3.5 mm.

Holotype: Auckland Instituts and Museum.

Type locality: West side of Takaka Hill, Nelson. (Amongst rocky outcrops, in leaf litter.)

Cytora pannosa (Hutton)

1883 Leptopoma pannosum Hutton T. N.Z. I. Vol. 15. p140.

Lagochilus pannosum (Hutton). Hedley and Suter. P.L.S. N.S.W. (2). vii 621.

Shell conical.somewhat angled at the periphery, dark brown and covered with ragged epidermis. Spire a little more than the height of aperture.Sculpture consists of oblique, very irregular membranous riblets often produced into triangular processes at or below the periphery. These are frequently worn off in mature shells or they can be absent altogether. Base with fine spiral striae, indistinct in some specimens. Suture impressed ,base flattish.

Height 3.25 mm. Diameter 2.75..

Type: Canterbury Museum . Type locality : Greymouth.

Selected locality records: Stoke -1-62; Puponga, F.M.Climo -5-66; Kahurangi -1-67; Seddonville -1-67; Greymouth -1-67; Haast F.M.Climo -7-67; Jacksons Head, F.M.Climo-10-67; Te Anau,J. Goulstone. -1-76; Resolution Island. -2-75.

Remarks: This is a common and variable species in the Nelson, Westland and Fiordland regions of the South Island.

Sculpture varies from practically smooth to quite strong processes at the periphery in most populations but finer ribbing is generally

more prevalent in the Nelson region with the more gross development of processes in the south, in Fiordland.

Cytora calva (Hutton)

1883 Leptopoma calva Hutton. T.N.Z.I. XV. 1882 (1883) 140.

Lagochilus calvum (Hutton): Hedley and Suter. P.L.S. N.S.W. (2) vii, 621.

Shell conical, reddish brown with a spiral band below the periphery Six and a half whorls rather flattened. Epidermis smooth with numerous growth lines. Suture impressed. The last whorl subangled at the periphery. Height 3.25mm Diameter 2.0 mm.

Type locality: Greymouth "- along with C. pannosa but is more acute than that species and not carinated and is perhaps only a variety." (From Hutton's description.)

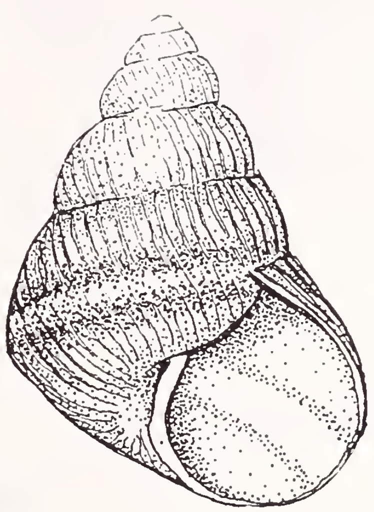
Remarks: Unfortunately the Type of C.calva cannot be located in the Canterbury Museum, and no other examples are available. Captain Hutton apparently had doubts as to its validity and wondered if it was only a variety. of pannosa. The measurements of the type of calva certainly fall in line with examples of pannosa that are without the membranous processes, - nor can the presence of a pale colour band around the body be considered of any consequence, for it occurs at random in pannosa and for that matter in several species. Also the spiral striae of pannosa is not a constant feature for it varies from quite distinct to very weak, or may be absent. It would seem best to include calva (Hutton) as a synonym of pannosa (Hutton).

The five endemic species from Three Kings Islands are listed together for conenience;

Cytora filicosta (Powell).

1948 Murdochia filicosta Powell. Rec. Auck. Inst. Mus. Vol.3, Nos. 4&5, p274, Pl. 53, fig. 4.

Shell small, conical, with lightly convex whorls and sub-angled periphery, narrowly umbilicate and sculptured with dense oblique membranous threads. Spire about twice the height aperture There are about fifty-five riblets on body whorl. Umbilicus a narrow chink partially obscured by reflexed basal lip. Live specimens dark brown colour, almost black. Worn and partially bleached shells exhibit spiral colour bands of lighter colour in the peripheral region.



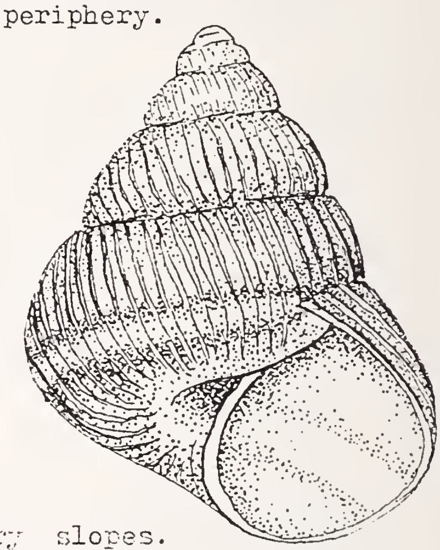
Height 4.2mm Diameter 2.9 mm. (Holotype).
Type locality: North East Island. (Common in leaf mould).
Holotype; Auckland Inst. Mus.
Localities: South West Island, common: South West Island, Very common.

Remarks: This species has obviously descended from the same stock as annectens but is narrower with a greater number of riblets. They do not occur together - each occupies different islands within this tiny group. See map, page 21.

Cytora annectens Powell 1948.

1948 Murdochia annectens Powell. Rec. Auck. Inst. Mus. Vol. 3, No4;5, P274, Pl 35, fig.3.

Shell small, broadly conical. Spire one and a quarter times height of aperture. Sculpture is of numeruos retractive, fairly regular oblique membranous axials, about fifty on body whorl . Umbilicus open, about one ninth diameter of shell . Colour light brown with two spiral bands of darker colour below the periphery.
Height 4.3 mm Diameter 3.4 mm. (Holotype)

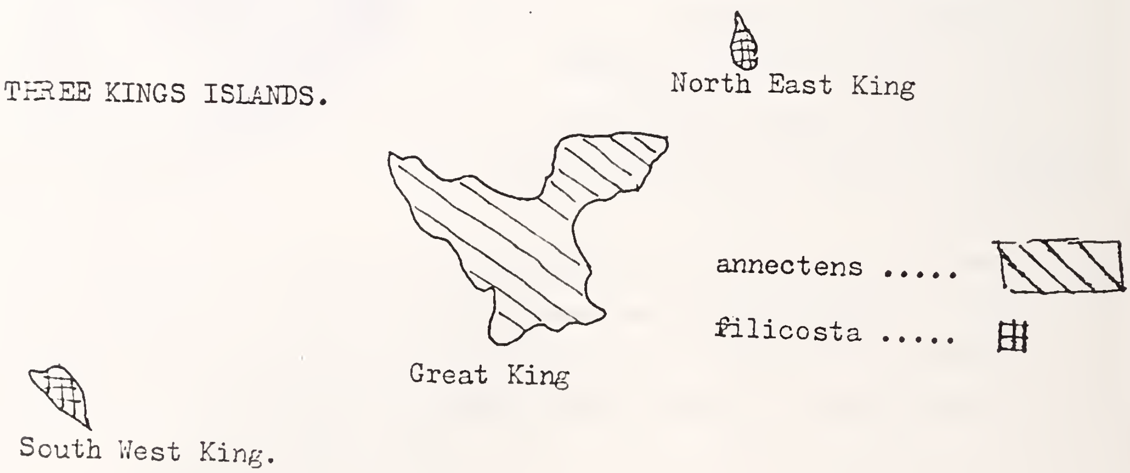


Holotype: Auckland War Memorial Museum.

Type locality: Great Island, Three Kings Islands. (Half a mile N.E. from South East landing on the under side of decaying wood in leaf mould, Kanuka Scrub).

Distribution: Restricted to the Three Kings Islands.

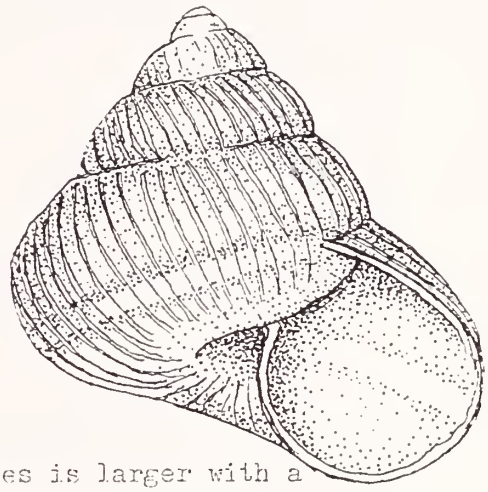
Remarks: Sporadic occurrence over most of Great Island. Usually found in the foliage of the sedge Carex under Kanuka on rather dry slopes. This species is obviously related to C. filicosta Powell which occurs on other islands of this small group.



Cytora solitaria(Powell 1935.)

1935 Murdochia solitaria Powell Proc. Mal. Soc.London. 21(6), 243-248.

Shell small, turbiniform, reddish brown. Spire about the same height as aperture. Sculpture comprises irregular radiating riblets of variable strength running across each whorl and around to the umbilicus. There are odd raised threads around the base. Suture impressed, whorls rounded. Umbilicus open,deep one fifth diameter of shell. There is a pale peripheral band present in some specimens.

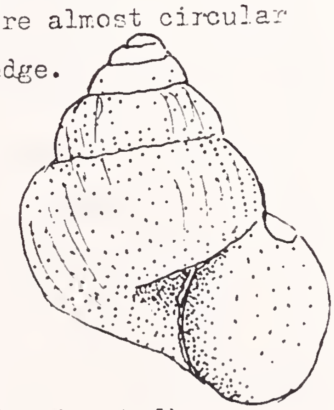


Diameter 3.50 Height 3.75mm.
Holotype: Auckland Institute and Museum.
Type locality:Tasman Valley. Great King Island.
Remarks: Restricted to the above Island where it is abundant and widespread.especially at the 'Arbutus' area. Compared with annectens which occurs on the same Island this species is larger with a broader profile,and wider umbilicus.

Cytora kaima Climo.

1973 Cytora kaima Climo. Jour. Roy. Soc. N.Z. Vol. 3, No 4. pp565-626.

Shell small, turbiniform, light brown colour and with evenly rounded whorls. Sculpture consists of irregularly developed and often weak rounded axial riblets. Apertuture almost circular outer lip thin, peristome double on parietal edge.



Height 4.0 mm Diameter 3.2 mm.
Holotype: National Museum .
Type locality: Some 200 m. below Tecomanthe vine, Tasman Valley, Great Island, Three Kings.
Remarks: Only one specimen is known and this had been dead for some time judging by the chalky

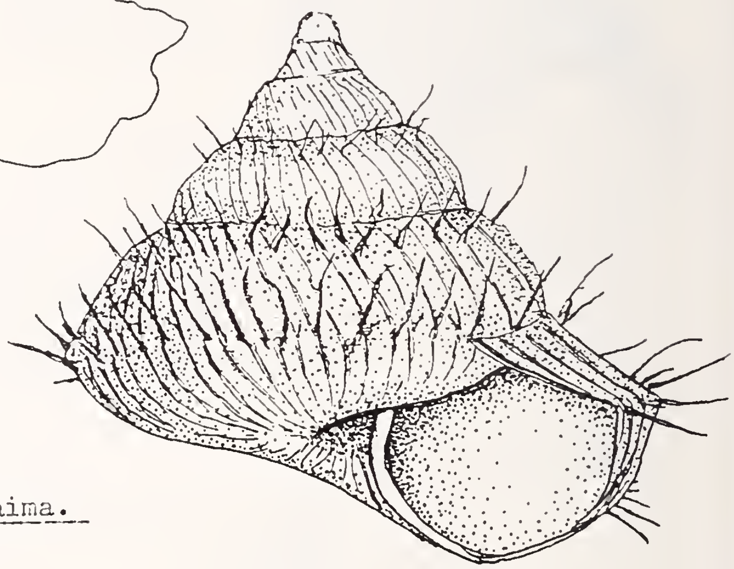
nature of the shell. It is very likely that this species is extinct -Climo 1973.

Cytora hirsutissma(Powell 1951).

1951 Murdochia hirsutissma Powell. Rec. Auck. Inst. Mus. Vol. 14. No.2, p132. pl 27. fig. 6.

Shell large for genus, trochiform, umbilicated . Early whorls tall and narrowly conicl but rapidly expanding over the last three whorls which bear complicated epidermal processes.
The body whorl is bi-angulate, one angle at the middle of whorl and the other below the suture. Both angles bear long hirsute processes, those on the middle angle being longer and more erect.

1. C. hirsutissma. 2. C. kaima.



There are about about fifty primary spirals on the body whorl and most of the bear processes. Colour golden brown, processes darker brown . Umbilicus deep, one seventh diameter of shell.
Height 6.0 mm Diameter 5.6 mm
Type locality: Great Island, Three Kings(South West coast and site of Placostylus bollonsi arbutus colony.)
Climo (National Museum Expedition 1970) found that this species is restricted to an area of about two metres square where it lives under large rocks which are covered by the fern Arthopteris tenella under a solitary Paratrophis tree.

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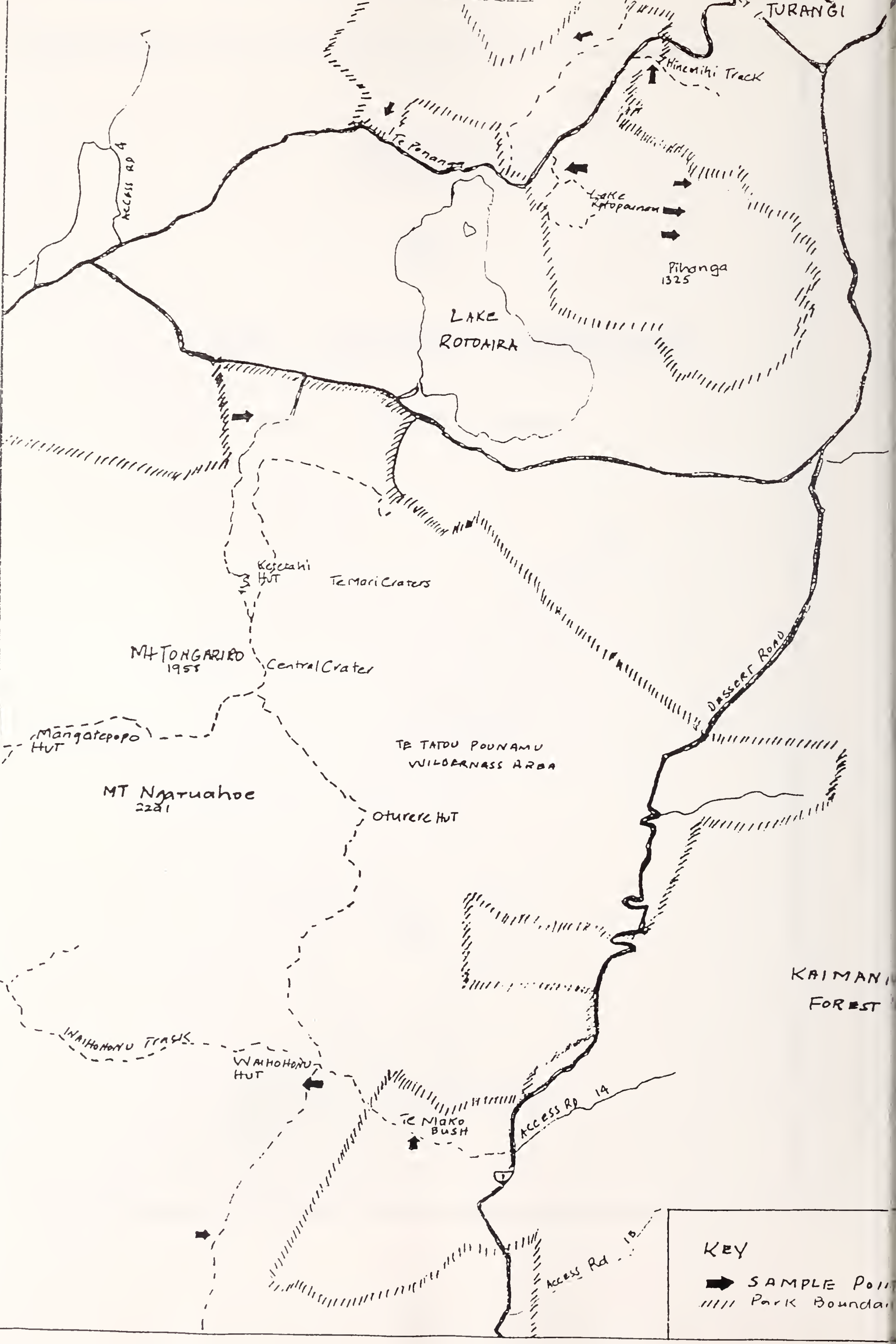
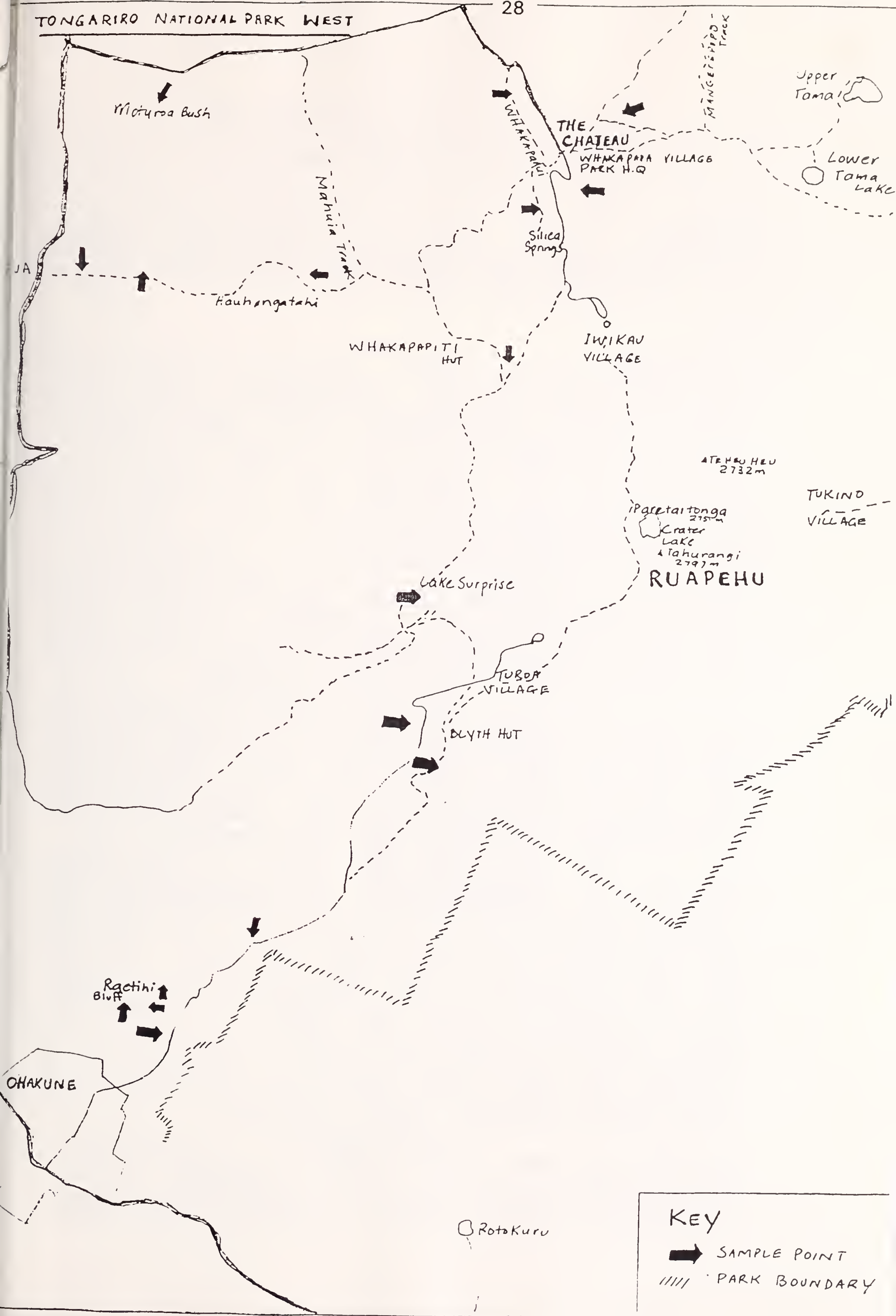
LANDSNAILS OF TONGARIRO NATIONAL PARK

Pauline C. MAYHILL 1982

TONGARIRO NATIONAL PARK - EAST




TONGARIRO NATIONAL PARK WEST
Moturoa Bush
THE CHATEAU
WHAKAPAPA VILLAGE
PARK H.Q
Upper Tama
Lower Tama Lake
Whakapapa
Mahuia Track
Silica Springs
Hauhungatahi
WHAKAPAPITI HUT
IWIKAU VILLAGE
TUKINO VILLAGE
Paretaitonga
Crater Lake
Tahurangi
RUAPEHU
Lake Surprise
TUROA VILLAGE
BLYTH HUT
Rangataua
Raetihi Bluff
OHAKUNE
RotoKuru
KEY
SAMPLE POINT
PARK BOUNDARY

LANDSNAILS OF TONGARIRO NATIONAL PARK.

Pauline C.Mayhill 1982.

ABSTRACT: This is a report of landsnail collecting in Tongariro National Park at intervals from June 1979 until February 1982. Ninety seven species were collected and illustrations number eighty five.

INTRODUCTION: There appears to be no specific list of landsnails within the Park. Searches have been made of older publications and the only reference found is by H.Suter. He lists Athoracophorus marmoreus (non Hutton 1879) Tongariro 3700ft. Athoracophorus suteri (Burton 1963). A comparison of previously listed species would have been most interesting.

Collecting was carried out during the months of January, February, June, July, August, and December. This should have resulted in a good cover for all species. The weather sometimes precluded work being carried out at higher altitudes unfortunately. At present there is particularly good bark cover in the areas of dead Beech forest, although there were greater numbers of species in the mixed podocarp and broadleaf vegetation. Altitude ranged from 620m at the Ohakune Ranger Station, to 1560m in the upper Whakapapaiti. Lower altitudes produced more variety, while the top range produced some fine specimens.

Sight collecting was carried out, with small amounts of litter taken from the Beech forest and also in areas of Cedar. Half litre bags of fine litter was collected for later sifting and sorting from Pihanga, Rotopounamu and Raetihi Bluff. Small samples of leaf litter were taken from under Coprosma pumila, C. cheesemanii, and Senecio bidwillii, these were not well endowed with species but some higher sites might repay further searches.

The most common species was a surprise to me - Punctid sericata - previously I had not seen many, and here it was present at all sites except the high altitude ones. Huonodon hectori was prevalent also. One single Phrixgnathus erigone was collected at Waihohonu and none were found on the Western side of the Park. Generally when Phenacohelix giveni is present the numbers are quite high -only three from 23 sites. Suteria ide was not common, with the exception of one site at Raetihi Bluff, there is a great outcrop of limestone here which is attractive to Suteria species. A single Liarea egea was collected in the South on the Ranger Station Track at Ohakune. This is remarkable and would perhaps indicate that this species was formerly more widespread. Present records do not place this species further South than latitude 38 degrees.

Schizoglossa novoseelandica (Pfeiffer) was seen live as indicated, numbers refer to shells picked up in leaf litter. Otoconcha dimidiata (Pfeiffer) was seen at five sites. I would have expected to find Rhytida greenwoodi (Gray) in the Pihanga, Tihia forests

but there was no evidence of it at all. The only larger snail found was one of 12mm from the Rotopounamu track. The columella was slightly broken and no identification resulted. Further searching on several occasions produced no other specimens. Athoracophorus bitentaculatus (Quoy & Gaimard), and Pseudaneita papillata (Hutton) were found at 1350m and down at 1000m. A large green slug as yet not identified was collected at 1220m. These large leaf veined slugs with an internal shell are found under bark or logs which are fairly moist.

COLLECTING LOCATIONS WERE: NZMS 260

A. Rotoaira North	T19 465395 680m	
B. Hinemihi Track	T19 477404 700m	
C. Rotopounamu Track	T19 467394 740m	
D. Pihanga	T19 498390 780m	T19 495384 800m.
	T19 495370 1180m	
E. Erua	S20 184167 1000m	S20 174 167 800m.
F. Waihohonu	T20 407182 1140m.	T20 445164 1000m.
G. Whakapapanui	S20 297185 1200m	
H. Whakapapaiti	S20 288148 1560m	
I. Ohakune. tall rimus	S20 201999 700m.	
J. Ohakune Ranger Stn track	S20 182979 620m.	
K. Lake Surprise	S20 256095 1240m	
L. Waitonga Falls	S20 265051 1220m.	
M. Silica Springs	S20 288175 1300m.	
N. Ketetahi Springs	T19 398327 840m.	
O. Moturoa Bush	S19 197213 840m.	
P. Mount Tihia	T19 466406 900m.	
Q. Whakapapaiti	S20 288147 1560m	
R. Mt Tihia	T19 474417 840m.	
S. Lake Surprise	S20 258089 1360m	
T. Mahuia Track	S20 237199 960m.	
U. Raetihi Bluff	S20 188988 840m.	S20 194996 800m.
	S20 193987 700m.	
V. Waihohonu	T20 402161 1200m.	
W. Whakapapanui Trig	S20 299184 1200m.	

LOCATIONS	A	B	C	D	E	F	G	H	I	J
Liarea egea										1
Cytora cytora					1					6
Cytora cf chiltoni	40	4	6	15	8		6		12	
Delos coresia				1	1					5
Prolesophanta n sp.				1	1					1
Charopa new sp					3					
Pseudegestula brookesi										
Paracharopa bianca	8		3		5					2
Paracharopa chrysaugeia					2					
Charopa coma					4					3
"Charopa" montivaga					2					
"Charopa" pilsbryi	2			2	1		22		1	1
"Charopa" parva										
Phenacharopa pseudanguicula	4		1	1		2	4			
Huonodon hectori	22	3	6	13	8	1	4		5	6
H.microundulata	7				2					
H.pseudoleioda	7	5	2	15	15				3	1
Mitodon wairarapa	1				3					
Pectola trilamellata										2
P.infecta	6				17					
Cavellia brouni					2				1	1
C.buccinella	27	3	12	15	21	1			2	11
C.colensoi					1				1	
C.anguicula	5								3	
C.irregularis										
C.reeftonensis										1
C.roseveari					7					
Flammocharopa costulata	3									
Geminoropa moussoni				1	1					
G.cf cookiana n sp	7	1	13	6	2					
G.cf akatarawa n sp										
G. cf microrrhina					1					
G. vortex					1					1
Mocella eta	3		4	7	7		1		2	1
"M." cf manawatawhia		2	1	3						
M. prestoni			2							
Therasiella neozelanica	10	2		5	8				6	
T. cf neozelanica										3
Suteria ide										
Flamulina chiron	2		3	1						
F. crebriflammis				1	2		3		1	
F. perdita		1	2	6	3					
F. zebra	7			1	4		8			1
Flammulina feredayi					2	1				
F. cf feredayi										1
Therasia traversi				2	1					
Allodiscus dimorphus							2		2	
A.cf granum	3	3		1						
A. planulatus					3					
A.cf tesselatus										
A. miranda										
A. new sp whakapapaiti										
A. new sp waihohonu						1				
"Allodiscus" urquharti									1	5

LOCATIONS	L	M	N	O	P	Q	R	S	T	U	V	W
Liarea egea												
Cytora cytora												
C.cf chiltoni			1	4	3		3			6		
Delos coresia										5		
Prolesophanta n sp.				1					1	2		
Charopa new sp												
Pseudegestula brookesi									5			
Paracharopa bianca	12						1		22	3		
P.chrysaugeia												
Charopa coma	1									47		
"Charopa" montivaga										2		
"Charopa" pilsbryi							7			1		
"Charopa" parva									14	2		2
Phenacharopa pseudanguicula	2				1		1	1	3	3	2	
Huonodon hectori		2		4	10		12		1	2	1	
H.microundulata										7		
H.pseudoleioda				2	2		1		2	14		
Mitodon wairarapa										3		
Fectola trilamellata												
F.infecta	9									12		
Cavellia brouni									1	6		
C.buccinella	3						6		3	12	1	
C.colensoi				1	6					20		
C.anguicula							4			11		
C.irregularis			4	2	5					13		
C.reeftonensis												
C.roseveari										3		
Flammocharopa costulata								5				
Geminoropa moussoni									1	3		
G.cf cookiana n sp		1	4				4			8		
G.cf "akatarawa" n sp										1		
G. cf microrrhina										3		
G. vortex												
Mocella eta			5		1		7		3	25		
M. cf manawatawhia			2	2			1		1	38		
M. prestoni										1		
Therasiella neozelanica					6			6				
T. cf neozelanica												
Suteria ide				1					2	13		
Flamulina chiron			1									
F. crebriflammis												
F. perdita		3	26				22			8		
F. zebra		2	3	1			4		12			
Flammulina feredayi						5				1		
F. cf feredayi								1		1		
Therasia traversi			7				7			8		
Allodiscus dimorphus			1	6					1	8		
A.cf granum			3	2								
A. planulatus		1					5	1	3	3		
A.cf tesselatus	1		4									
A. miranda							2					
A. new sp whakapapaiti						12						
A. new sp waihohonu												
"Allodiscus" urquharti												

LOCATIONS	A	B	C	D	E	F	G	H	I	J	K
Phenacohelix ponsonbyi	1		1	1							
P. lucetta					2				2	2	
P. rusticus	5		1						1		
P. giveni	1										
P. pilula											
Omphalorissa purchasi				7							
Schizoglossa novoseelandica	2	live	live	1	live		live		live		
Otoconcha dimidiata			live		live					live	
Laoma mariae	4			3	4				3	4	
L. marina					7				3		
L. poecilosticta					1				1		
Punctid ciliata					1				4	1	
Phrixgnathus ariel					1					1	
P. erigone						1					
Taguahelix viridula											
Punctid sericata	50	10	12	47	21	4	2		5	9	[illegible]
P. serratocostata	11			7	4				1	1	
P. lateumbilicata	59	7	10	28	10		2		19	30	
P. microreticulata										1	[illegible]
P. new sp 15					1						[illegible]
P. new sp 1	2	2	4	12	2				2	2	
P. new sp 30								2			
P. new sp cf 30				2	1			1			
P. new sp cf 1											
P. new sp 5										1	
P. new sp 29	20	5	9	7					4	2	
P. new sp cf 6										5	
P. new sp 43				1	2					2	2
P. new sp 8	5		2	5	3		2				1
P. new sp 69		3		1	3						
P. new sp 61	4	3	1	6	2				1	1	1
P. miserabilis			1								
P. new sp 44					1						
P. caputspinulae											
P. allochroida											
P. new sp 32	5	2		2							
P. new sp cf 7											
P. new sp 12	4		1		2						
Obanella rimutaka	2	1	1	1							
O. spectabilis			5	12			2		3	2	
Pasmaditta jungermaniae											

LOCATIONS	L	M	N	O	P	Q	R	S	T	U	V	W
Phenacohelix ponsonbyi												
P. lucetta				1			1			41		
P. rusticus				3			1			36		
P. giveni										2		
P. pilula										14		
Omphalorissa purchasi				4			3			6		
Schizoglossa novoseeland.	live		live	live				live		live		
Otoconcha dimidiata				live						live		
Laoma mariae		2		5			5			12		
L. marina										9		
L. poecilosticta										7		
Punctid ciliata										23		
Phrixgnathus ariel										2		
P. erigone											1	
Taguahelix viridula							1			1		
Punctid sericat.	3	5	2	4	3		9	1	1	14	4	2
P. serratocostata			1	1	2		3			1		
P. lateumbilicata		10	28		1		25					
P. microreticulata								1			1	
P. new sp 15	2											
P. new sp 1	4	3	3				5	1		5	1	1
P. new sp 30	1		14			7	1			14	2	
P. new sp cf 30	1											
P. new sp cf 1						8		1	1	2		
P. new sp 5												
P. new sp 29			2				13			20	4	
P. new sp cf 6	2											
P. new sp 43										2		
P. new sp 8			3	2	1			1	1	2		
P. new sp 69			1						1	1		
P. new sp 61		3	1				1	1		5		
P. miserabilis							1					
P. new sp 44									1			
P. caputspinulae										1		
P. allochroida										11		
P. new sp 32			2				4		1	2		
P. new sp cf 7									2			
P. new sp 12										1		
Obanella rimutaka										1		
O. spectabilis					1					1		
Pasmaditta jungermaniae						16	2	1	1	1		

SPECIES COLLECTED:

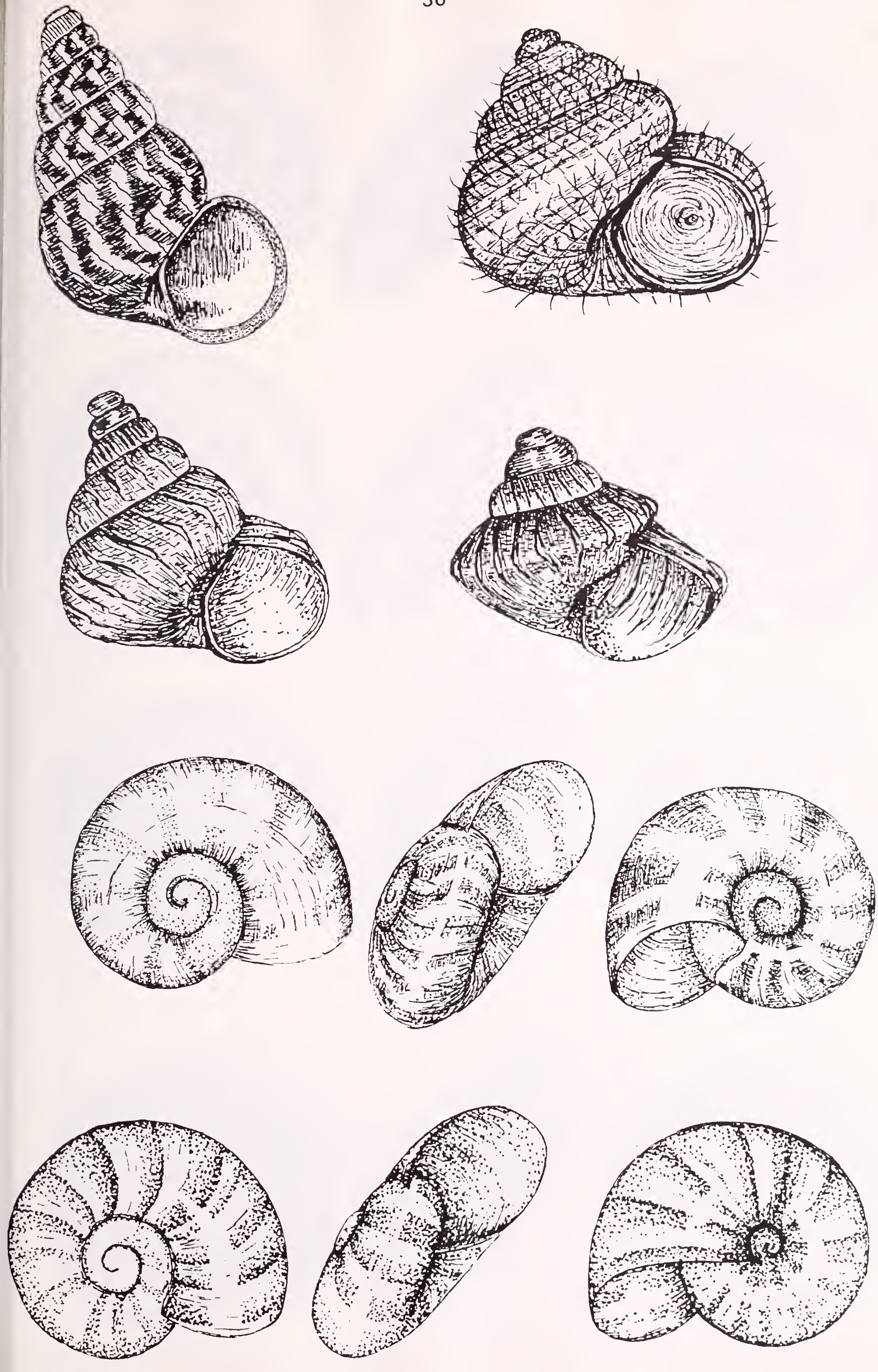
Liarea egea (Gray 1850) A single specimen only, with goood colour pattern and shell configuraton. Some Southern shells are very dumpy in appearance.

Cytora cytora (Gray 1850) A good distinctive shell character, strong bristles. 2.5 x 2.5mm

Cytora cf chiltoni. Many were found. An attractive operculate snail with good axial ribs. Often found under wet leaves. Adult 2.4 x 1.9mm Juvenile 1.2 x 1.4mm.

Delos coresia. (Gray 1850) Wellcoloured and glossy. 2.8 x 1.4mm

Prolesophanta n sp.(Roscoe.) A small species, distribution centred on Tongariro. Extends from Auckland (not common) down to Martinborough limestone. (subfossil) 2.0 x 1.0mm



Charopa new sp cf pseudanguicula. More sinuous riblets than pseudanguicula with spirals on protoconch. 2.3 x 0.9mm

Paracharopa bianca (Hutton 1883) Common under bark, pale colour with darker stripes, protoconch plain.
2.4 x 1.0mm

Paracharopa chrysaugeia (Webster 1904) Smaller species, good golden colour, dimpled protoconch. 2.2 x 1.0mm

Charopa coma (Gray 1843) Often found under loose bark, sometimes in litter. Tends to live in colonies. Very strong riblets, attractive colour pattern. Shiny protoconch.
4.5 x 2.4mm

"Charopa" montivaga (Suter 1894) Similiar in appearance to C. coma but finer ribbing. 3.8 x1.9mm

Phenacharopa pseudanguicula (Iredale 1913) Small very dark coloured shell with a broken pattern of white on outer whorl. Smooth protoconch, bark dweller under or in crevices.
1.6 x 0.7mm

"Charopa" pilsbryi (Suter 1894) Small shell, last whorl increases rapidly. Very fine riblets, reddish brown with paler flashes. 2.5 x 1.4mm

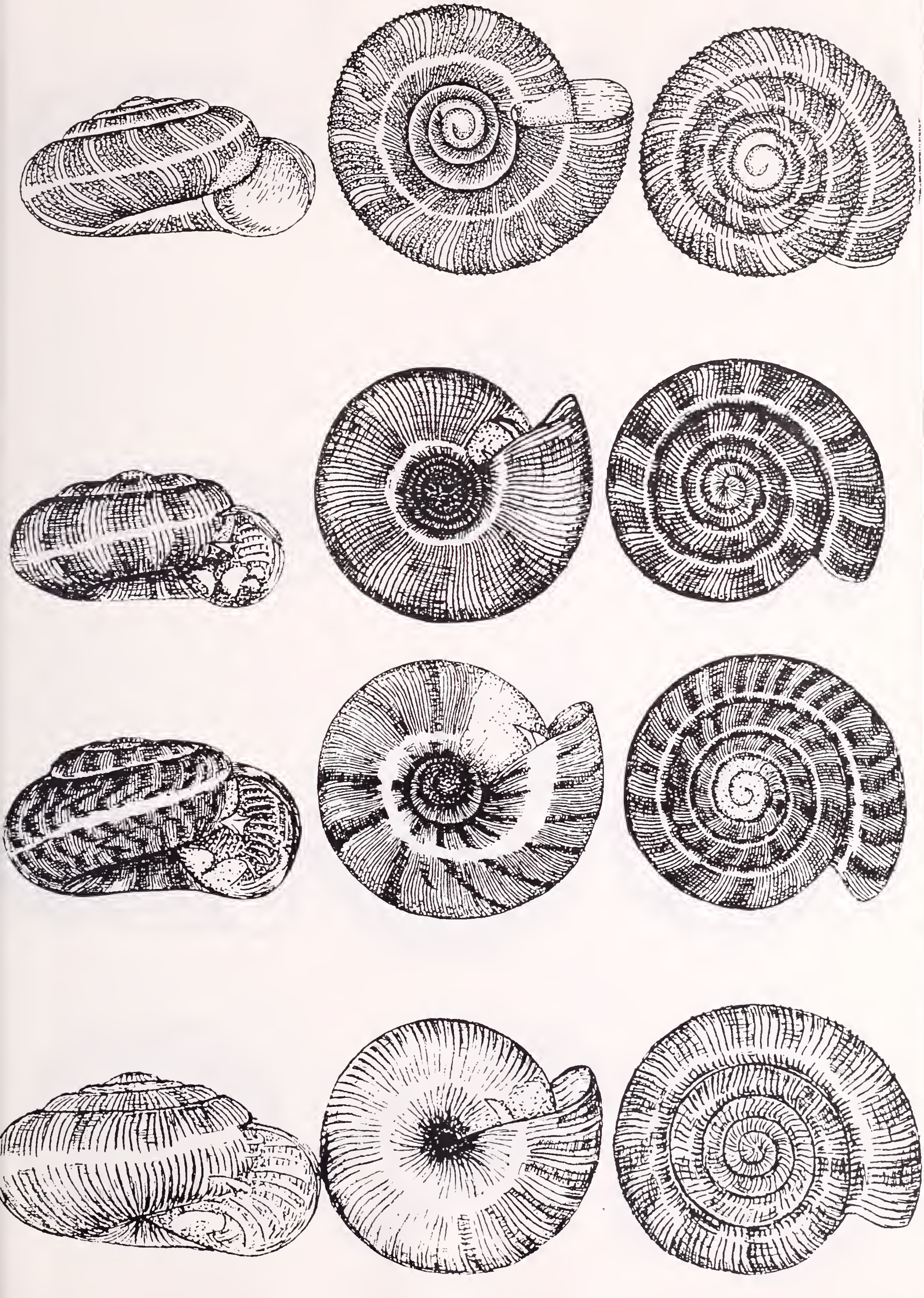
"Charopa" parva (Suter 1909) Larger umbilicus, slightly flatter in profile, spirals on protoconch.
2.0 x 1.3mm

Pseudegestula brookesi (Dell 1954) much finer sculpture than montivaga, ribs slightly sinuous. 3.00 x 1.5mm

Huonodon hectori (Suter 1890) A small shell with strong gold and brown colour pattern, finely ribbed, ribs continuing onto protoconch. Strong apertural barriers. 1.6 x 0.7mm

Huonodon microundulata (Suter 1890) Also small and similiar enough to confuse. More elevated with a base pattern of zigzags of darker brown. Never as common. 1.8 x 0.9mm

Huonodon pseudoleioda (Suter 1890) pale greyish colouring with closed umbilicus, coarser ribbing, more domed and generally fairly common, litter dweller. 2.3 x 1.3mm

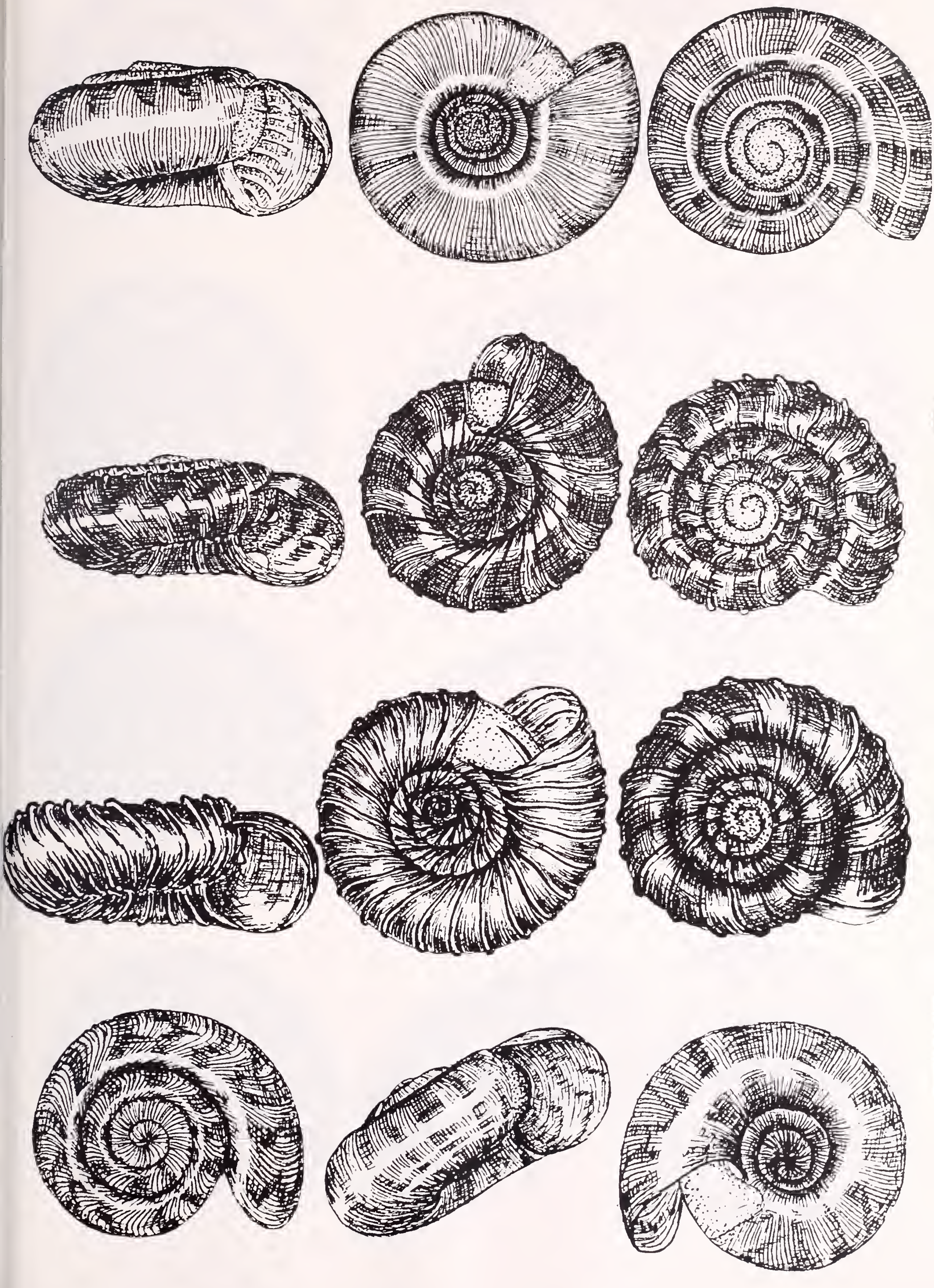


Mitodon wairarapa (Suter 1890) dimpled protoconch, very fine ribs, colour similiar to hectori and easily overlooked.
1.4 x 0.7mm

Fectola trilamellata (Climo 1978) Very distinctive,strongly sinuous ribs, dark colouring and three pronounced lamellae.
2.8 x 1.3mm

Fectola infecta (Reeve 1852) Always a good size, has three lamellae, one readily visible. 3.4 x 1.6mm

Cavellia brouni (Suter 1891) Small delicate shell, pale colour, wide perspective umbilicus. 2.0 x 0.8mm



Cavellia colensoi (Suter 1890) A large coarsely ribbed shell, can be confused with C. anguicula. 4.0 x 2.0mm

Cavellia anguicula (Reeve 1852) Another large pale shell with coarse ribs, protoconch has very fine ribs and teleoconch ribs microscopically show blades.
4.5 x2.2mm

Cavellia irregularis (Suter 1890) Smaller shell with wide umbilicus, ribs acutely angled, and every second rib is higher. 2.7 x 1.4mm

Cavellia reeftonensis (Suter 1892) fairly tightly coiled with medium strength ribs, more domed profile.
2.9 x 1.6mm

Cavellia roseveari (Suter 1896) very fine silky appearance, tightly coiled, pale colour markings. These specimens found in Cedar forest. 3.0 x 1.7mm

Cavellia bucinella (Reeve 1852) A common species throughout. Well marked and colourful, fine axial ribs on protoconch.
2.5 x 1.3mm

Flammocharopa costulata (Hutton 1883) Velvety dark brown in appearance, fine ribs and found under bark or logs.
3.3 x1.9mm

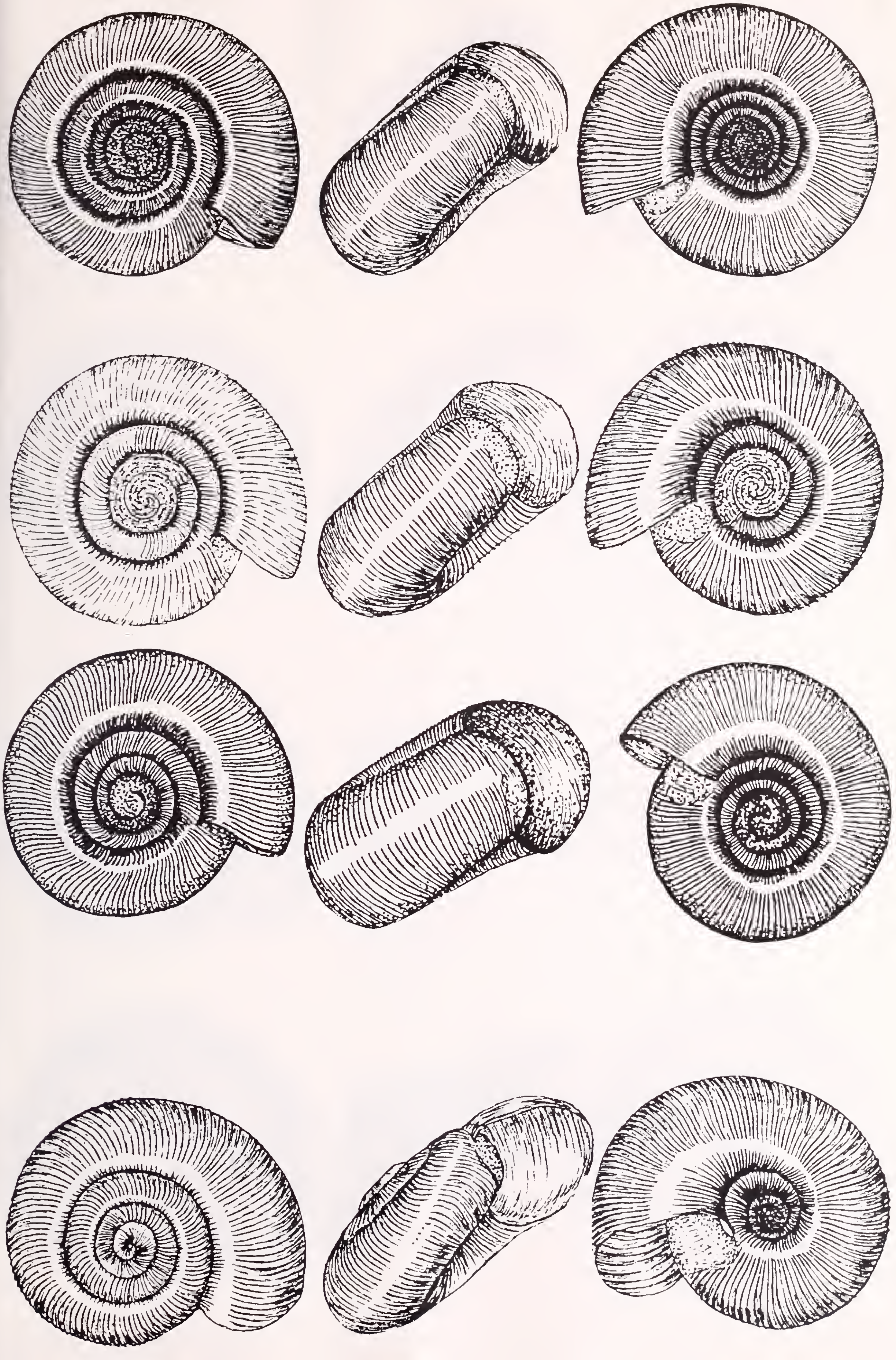
Geminoropa moussoni (Suter 1890) Regretably the only large specimen was broken. White shell with sunken spire, protoconch very shiny.

Geminoropa New sp (Climo) cf microrhina. smaller finer white shell with sunken spire. 1.4 x 0.7mm

Geminoropa vortex (Murdoch 1897) Small shell, white sometimes horny, closely ribbed, spirals on protoconch.
1.3 x o.7mm

Geminoropa new sp (Climo) cf cookiana White shell well ribbed, dimpled protoconch. Many in Northern and Western sections.
1.4 x 0.8mm

Mocella eta (Pfeiffer 1853) small white shell with radials on protoconch. Not found at higher altitudes. Found in litter. 2.3 x 1.1mm

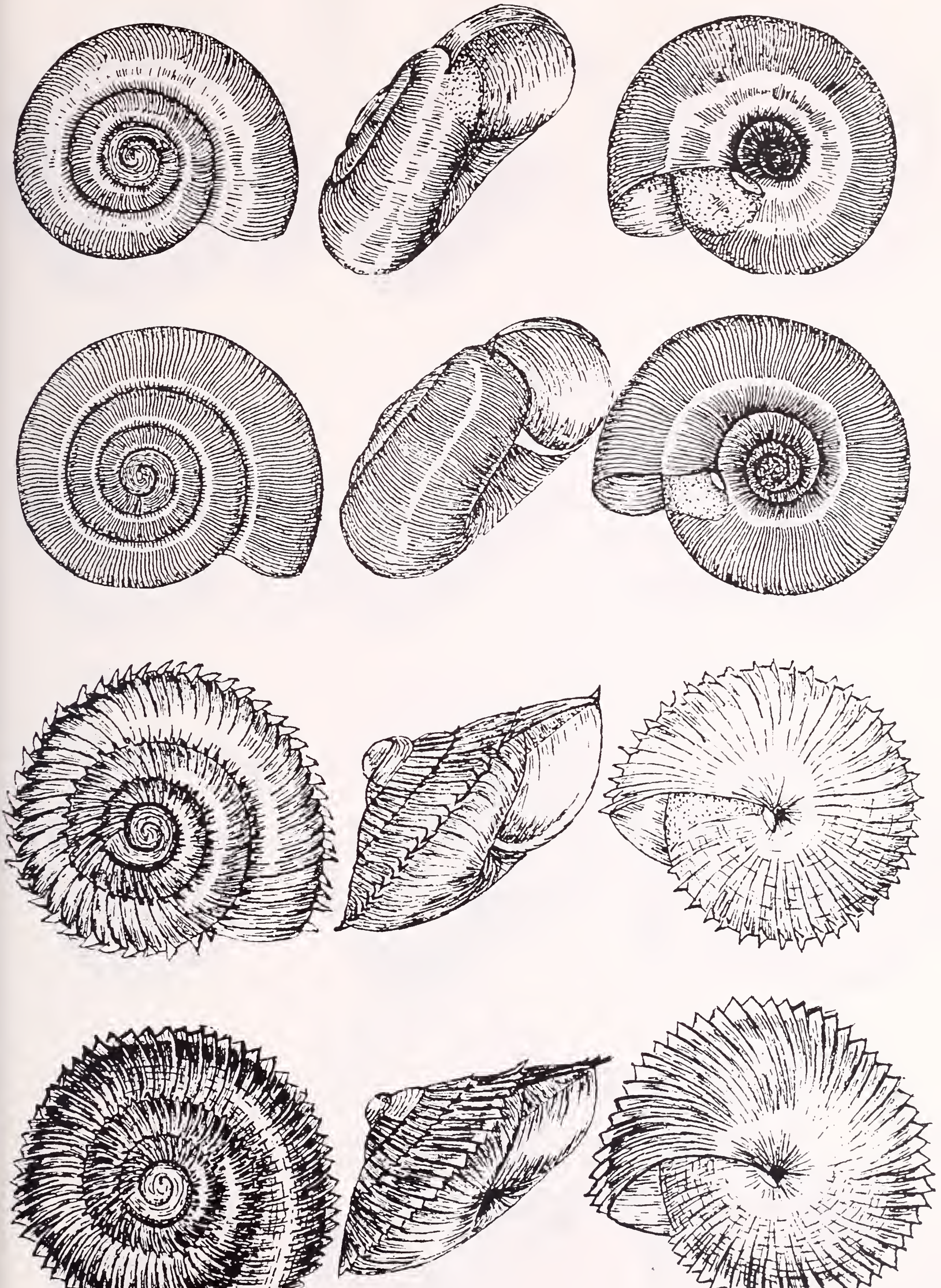


Mocella prestoni (Sykes 1895) Small white shell with five spirals on protoconch, slightly finer than M eta. Retrieved from litter.2.2 x 1.0mm

"Mocella" new sp cf manawatawhia Climo unpublished. Very finely ribbed with good colour pattern, spiral protoconch with abrupt cut off. 2.6 x 1.4mm

Therasiella cf neozelanica. Modest numbers though not uncommon, found in North and South Islands, generally tucked into bark crevices. 2.5 x 1.5mm

Therasiella neozelanica (Cumber 1967) Fine spirals on protoconch, membraneous plaits overlap. 3.0 x 1.5mm

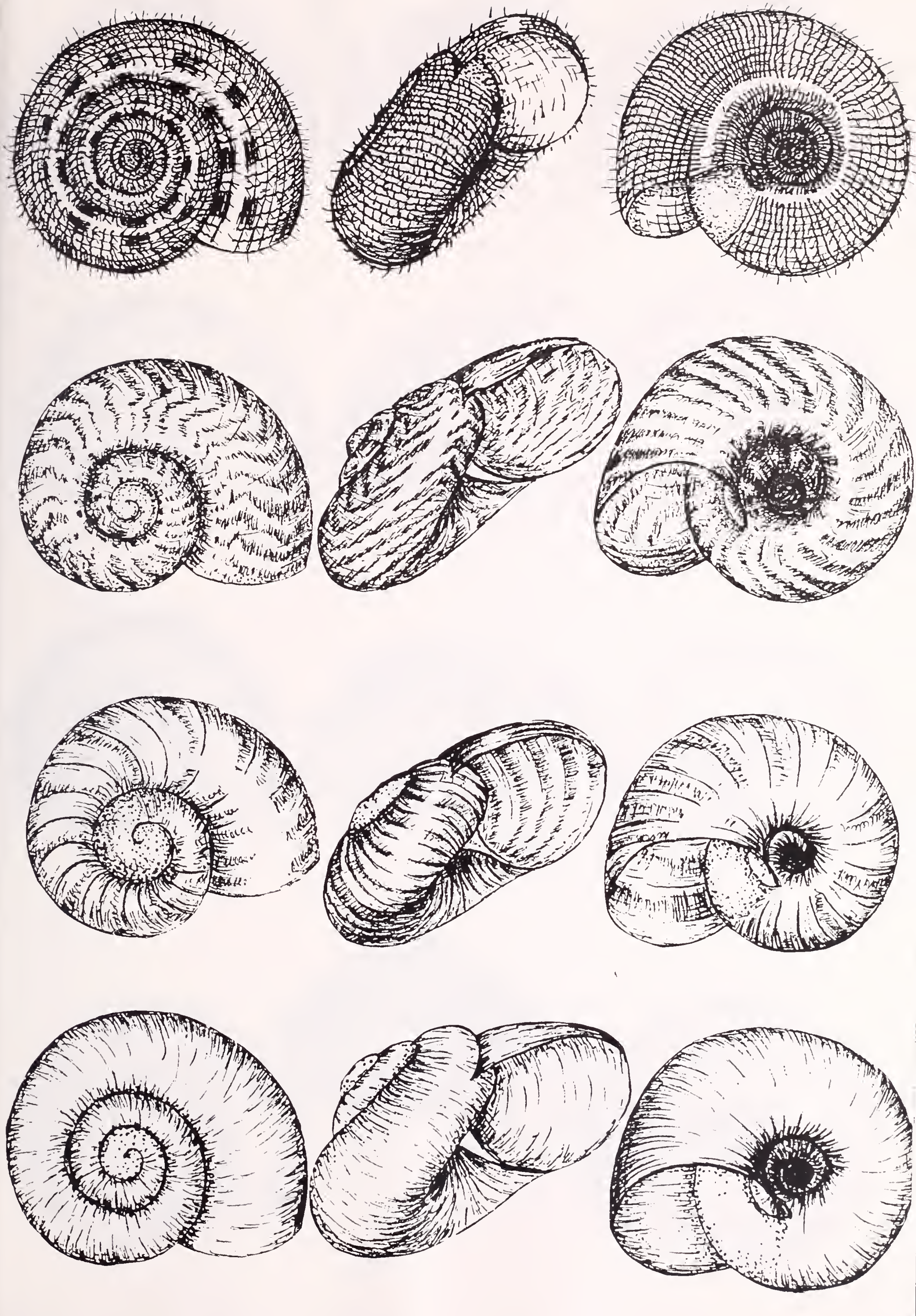


Suteria ide (Gray 1850) Yellowish brown shell with many dark brown hairs, ribs not regular. Very few collected.
7.0 x 3.5mm

Flammulina crebriflammis (Pfeiffer 1853) Black and red colouring, very polished appearance, under bark and likes damp spots. 6.5 x 4.0mm

Flammulina cf crebriflammis/chiron. New species with good colour pattern and riblets. Similiar habitats.
3.0 x 1.5mm

Flammulina perdita (Hutton 1883) Pale unicoloured shell, shiny, and quite common, tree dweller. 6.5 x 4.5mm



Flammulina zebra (Le Guillou 1842) A well coloured shell with red and black markings. Closed umbilicus, often under bark, may be associated with Ear fungus - Auricularia polytricha.

7.0 x 4.5mm

Flammulina feredayi (Suter 1891) Very small shell almost transparent, with fine riblets and 10 - 13 spirals on the protoconch. 1.7 x 1.0mm

Flammulina new sp cf feredayi. Larger than F. feredayi, greenish colour with very many fine spirals on the protoconch. This appears in modest numbers throughout the Park. 2.5 X 1.7mm

Therasia traversi (E.A.Smith 1884)Large shell, brown with red zigzag pattern. Shell remarkably fragile. Common, many live specimens seen. 11.0 x 6.0mm

Flammulina chiron (Gray 1850) Yellowish transparent shell with sharp riblets. 3.0 x 1.8mm

Allodiscus dimorphus (Pfeiffer 1853) Large well patterned with a rounded appearance, coarse ribbing. 7.5 x 4.5mm

Allodiscus "miranda" (Hutton 1883) Very beautiful shell with fine ribbing and look of dark velvet. Not as fine as A. granum. 2.8 x 2.0mm

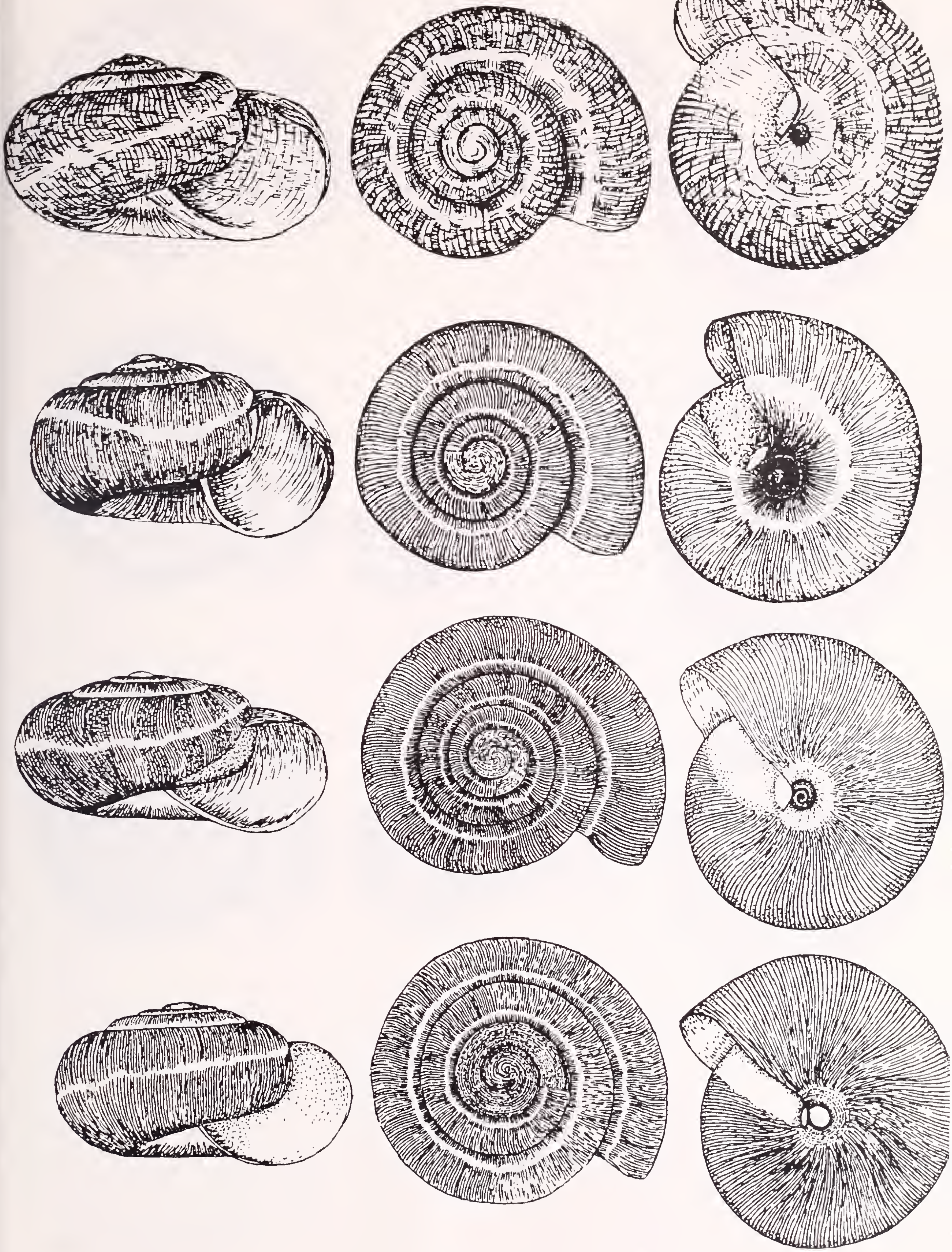
Allodiscus planulatus (Hutton 1883) More coarsely ribbed pale shell with ginger patches. Umbilicus distinctive with almost white surround. Variable. 2.8 x 1.6mm

Allodiscus new sp cf tesselatus. Narrow umbilicus paler surround. Pale buff with reddish brown markings. Collected in lighter forest or scrub. 3.4 x 2.2mm

"Allodiscus" urquharti (Suter 1894) Very small chocolate coloured shell, finely ribbed with good spirals on the protoconch. 1.8 x 1.0mm

Allodiscus new sp Whakapapaiti. Fine sculpture and lower profile. 4.0 x 1.8mm

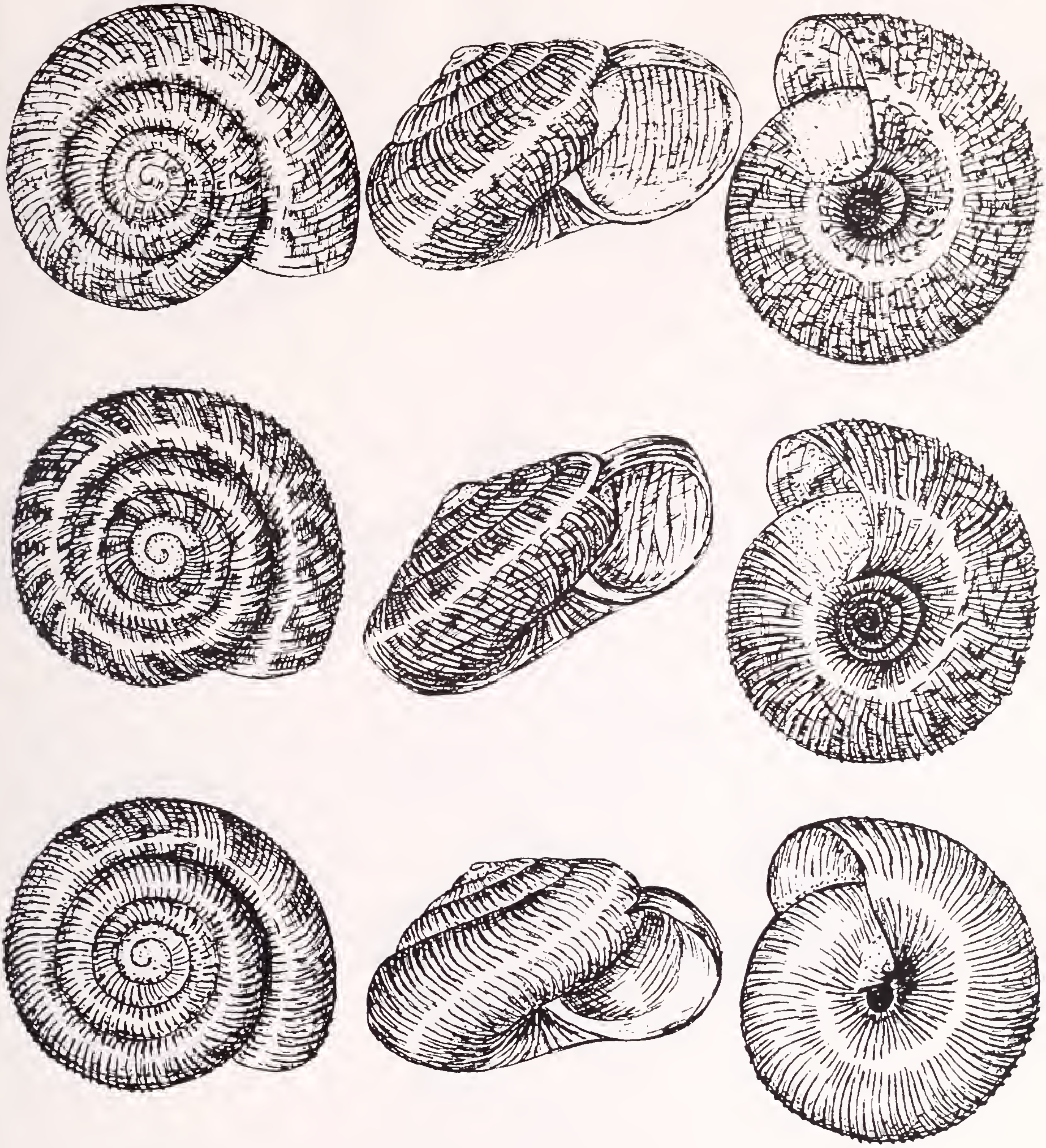
Allodiscus new sp " white " Waihohonu A much smaller species, very fine spirals on protoconch, much finer species than A. chion. 1.4 x 0·9mm



Phenacohelix ponsonbyi (Suter 1897) Strong shell with good colour. Very faint spirals on the protoconch. Possibly a tree dweller. 6.0 x 4.0mm

Phenacohelix lucetta (Hutton 1884) Appearance and colour resembles Charopa coma, but lucetta has a very angled body whorl, wide umbilcus. 6.0 x 3.5mm

Phenacohelix rusticus (Suter 1894) Good colour with strong white patches, more depth to shell and stronger ribs.
4.5 x 3.0mm

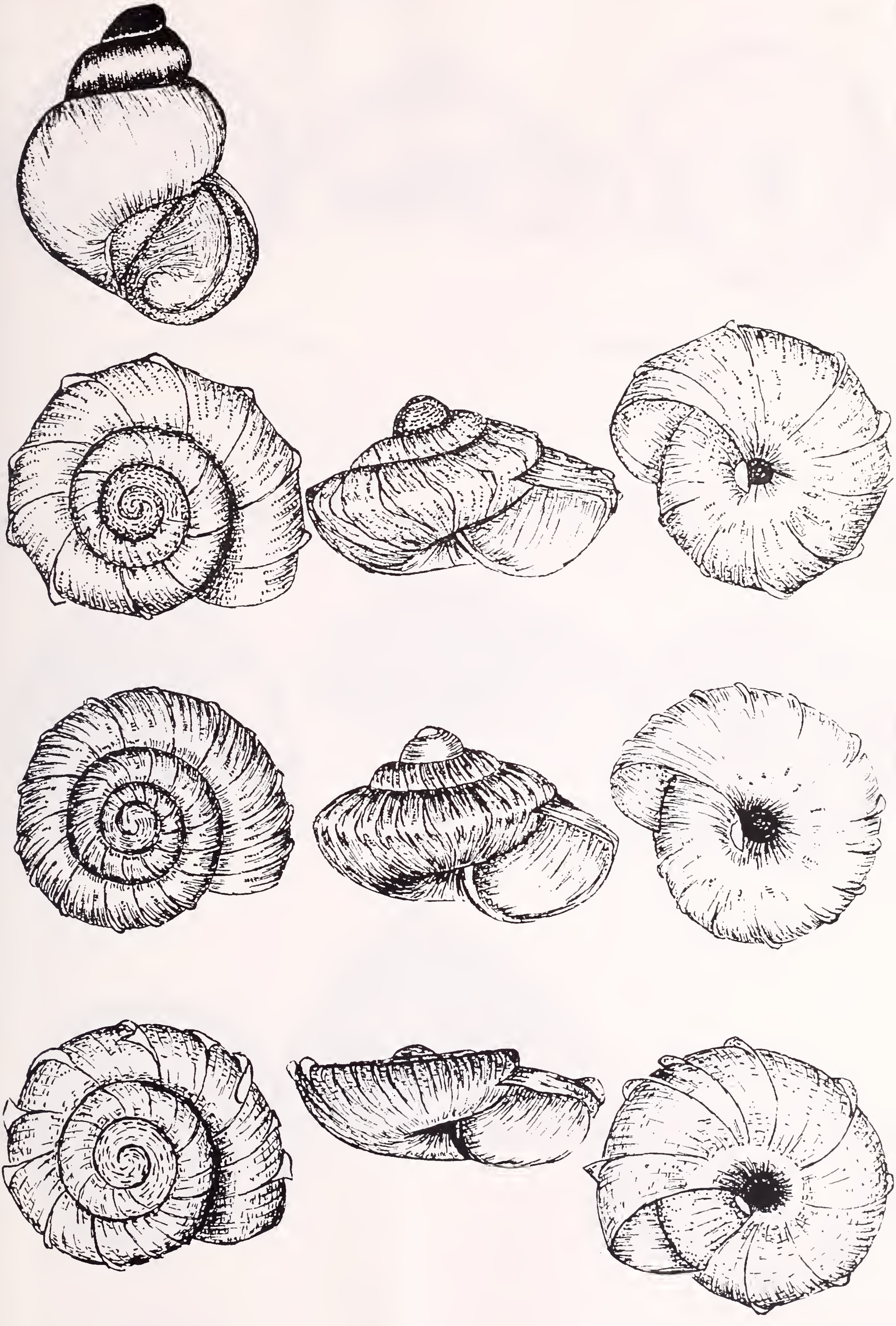


Omphalorissa purchasi (Pfeiffer 1862) Can be picked up by accident as its small and when wet attaches to clothing or hands. Operculate. 2.0 x 1.5mm

Punctid new sp 12. undescribed, similiar in appearance to Obanella rimutaka, and often found together, blades less numerous. 1.3 x 0.8mm

Obanella rimutaka (Dell 1952) Moderately elevated spire, blades rounded, good keel on shell, straw coloured.
1.8 x 1.2mm

Obanella spectabilis (Powell 1928) May be found in association with the above species but has a very flattened and distinctive profile. Conspicuous blades ,straw coloured.
1.3 x 0.7mm

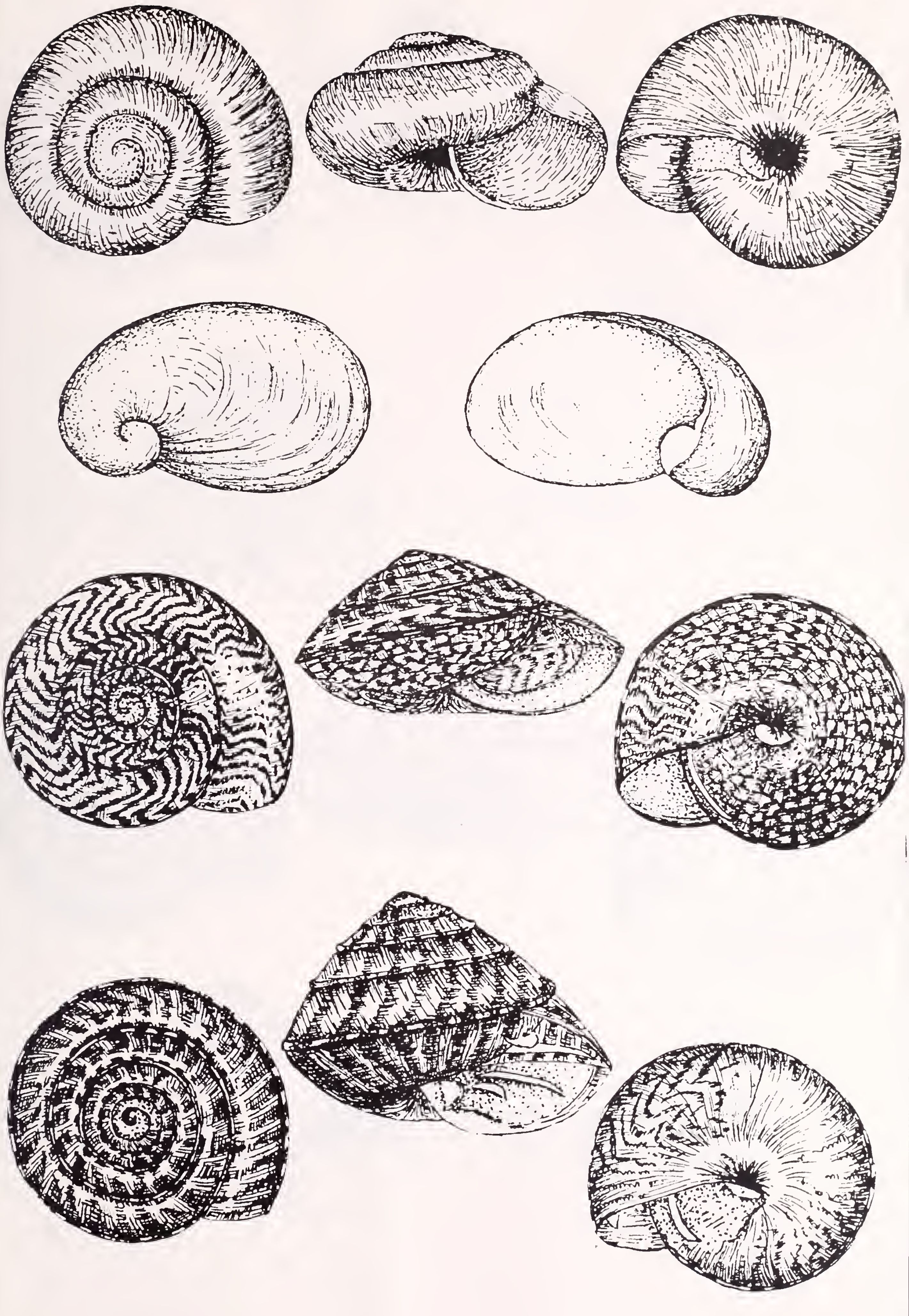


Pasmaditta jungermaniae (Pettard) Small, greenish colour, fragile appearance. Tree trunk dweller. Tasmanian species.
2.5 x 1.3mm

Schizoglossa novoseelandica (Pfeiffer 1862) Commonly called Paua slug and the shell has a definite similarity, black animal usually found at rest and retracted, under very damp bark on the ground.

Laoma mariae (Gray 1843) colourful, reddish and white markings, strong keel. Common. 4.6 x 2.5mm

Laoma marina (Hutton 1883) Colour varies and some albino specimens occur. Good sculpture and strong lamellae in the aperture. 3.4 x 2.4mm

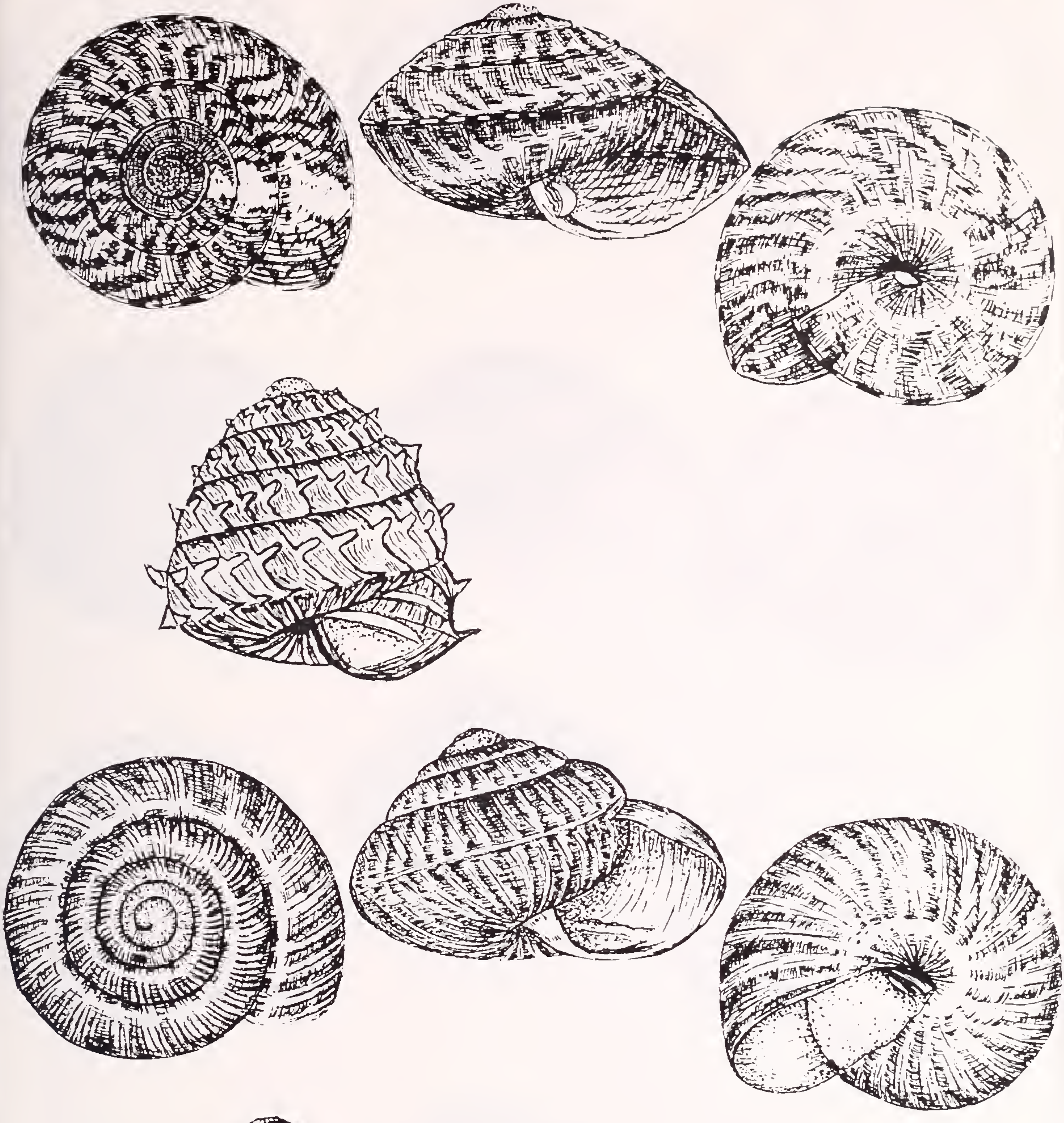


Laoma poecilosticta (Pfeiffer 1853) Dome shaped shell , sutures well marked, thickened lamellae at middle of columella. Horny colour with reddish brown streaks.
3.5 x 2.5mm

Laoma ciliata (Suter 1894) Minute but very distinctive and handsome shell. Strong projections, pale cream.
1.6 x 1.8mm

Phrixgnathus ariel (Hutton 1883) Keeled at base, strong radial sculpture which does not carry onto the base.
3.0 x 2.0mm

Phrixgnathus erigone (Gray 1850) A conical shell often grayish in colour with stripes of dark grey or brown. Often on damp vegetation. 1.5 x 1.4mm

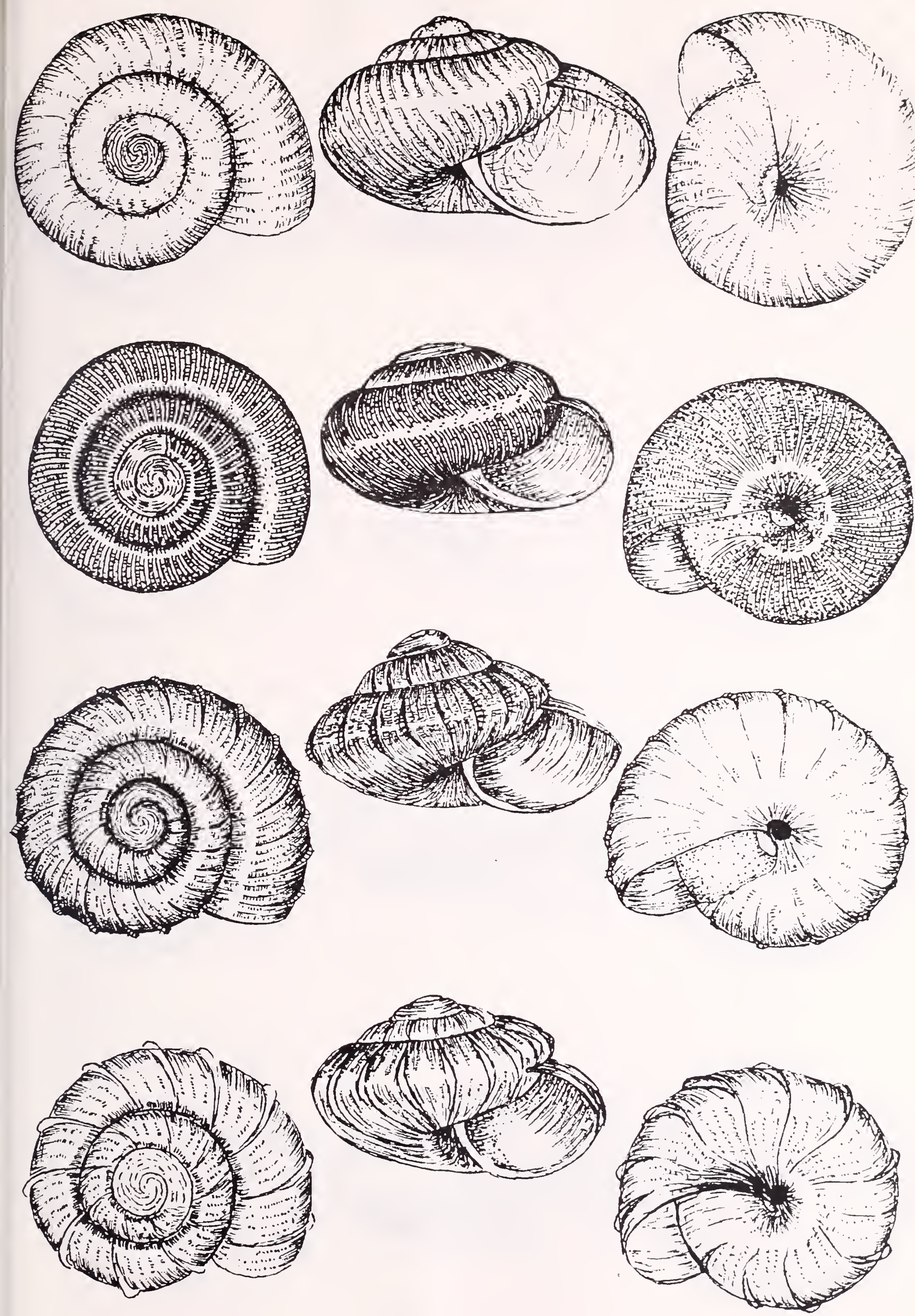


Taguahelix viridula (Suter 1909) Globose shell , translucent greenish colour, quite distinctive. 2.4 x 1.5mm

Paralaoma sericata (Suter 1890) Shining white , closed umbilicus, very fine spirals on protoconch. Very common in the Park. 1.3 x 0.8mm

Punctid serratocostata (Webster 1906) Horny minute shell with serrated blades, base flattened. 1.0 x 0.7mm

Punctid new sp 15. Undescibed species with strong blades, found in leaf litter. More common in the South Island. 1.3 x 0.8mm

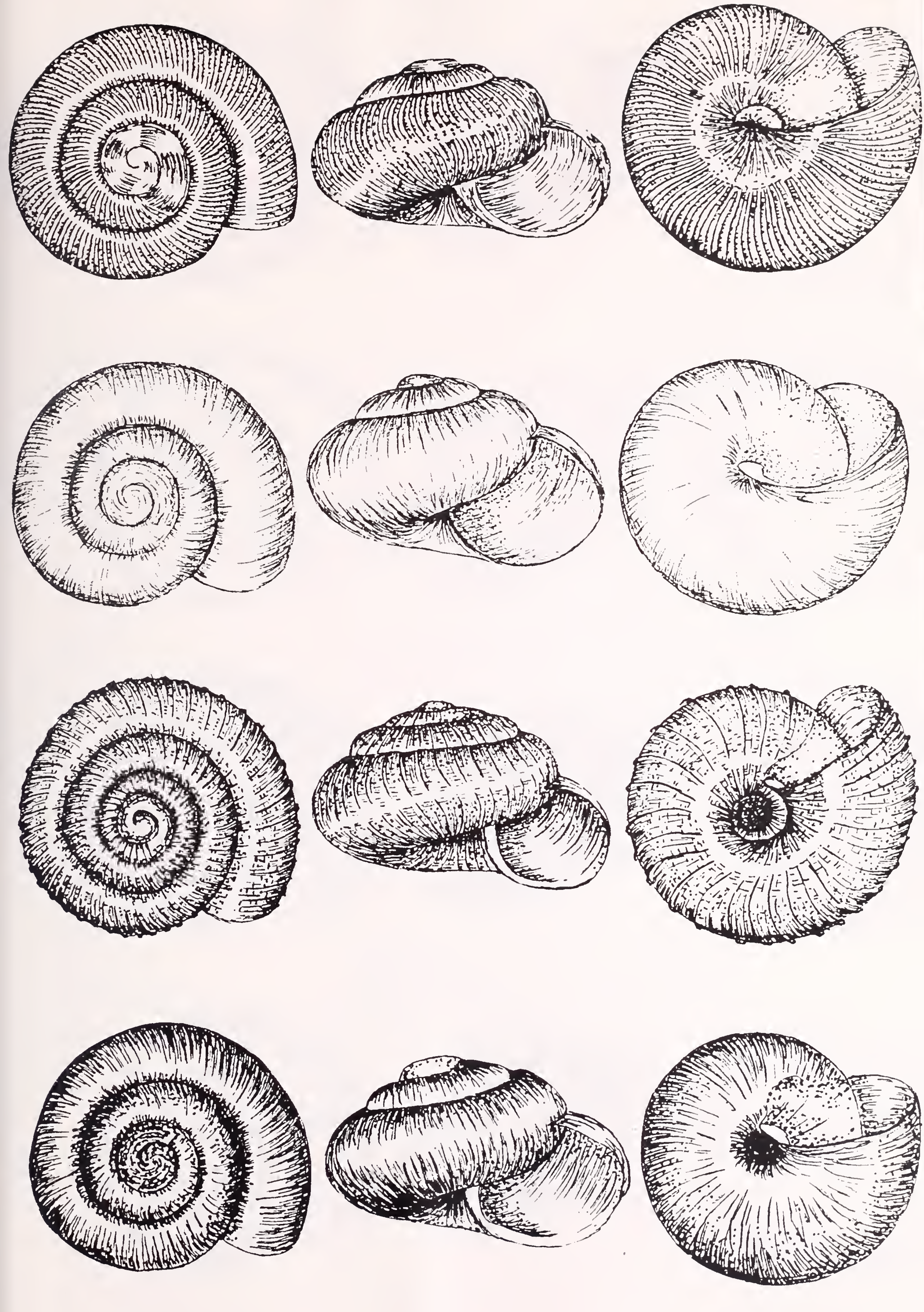


Punctid new sp 1. In this area relatively common . Very fine ribs, strong brown colouring. A shell with character.
0.9 x 0.6mm

Punctid new sp cf 30 very fine sculpture, spirals on protoconch. 1.1 x 0.8mm

Paralaoma lateumbilicata (Suter 1890) Common small snail with attractive radial ribbing on pale straw shell.
1.6 x 1.0mm

Punctid new sp 32. Preferred habitat off the ground, can be collected by beating. 0.9 x 0.5mm

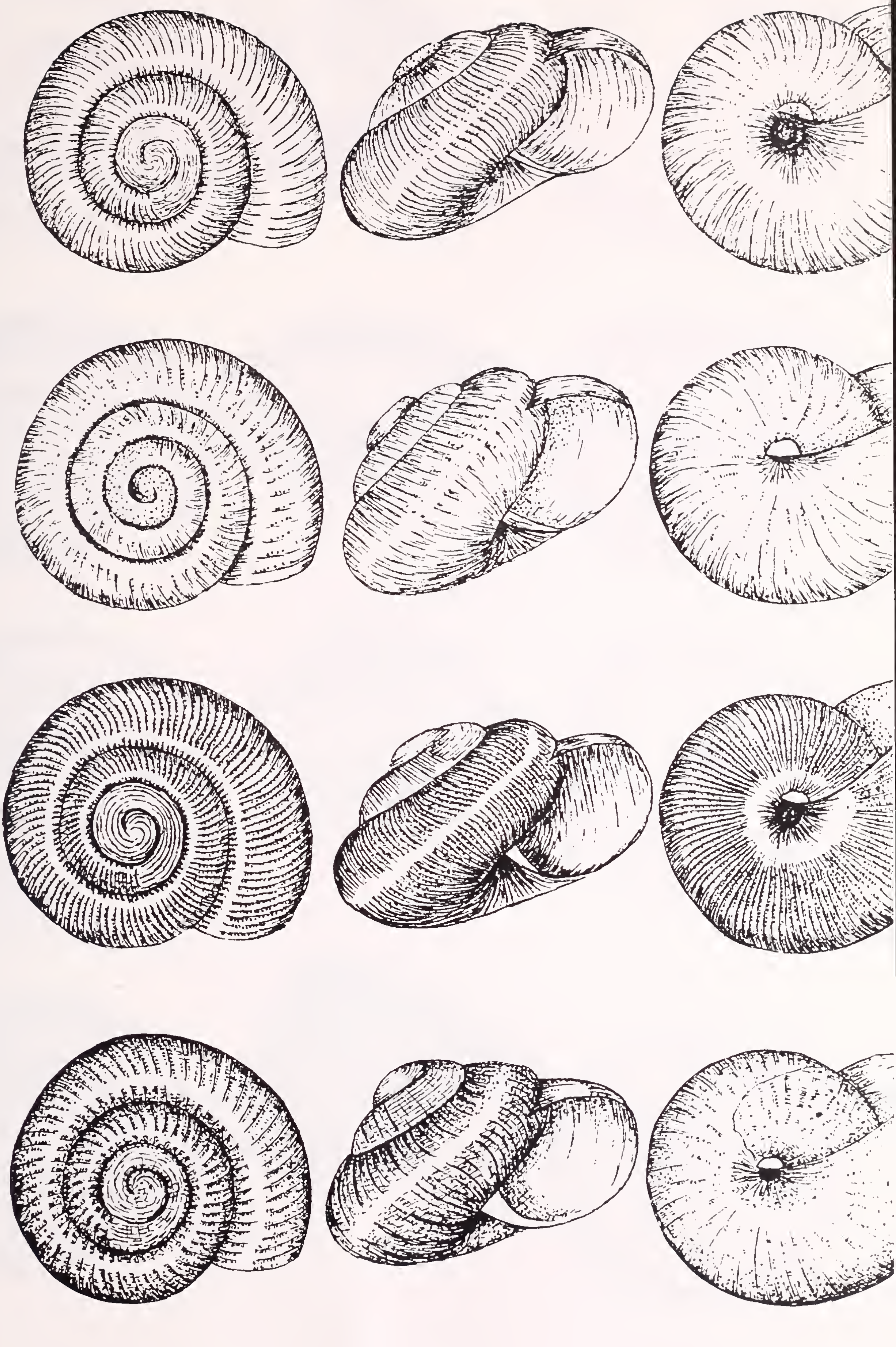


Punctid microreticulata (Suter 1890) very pale shell with fine sculpture, only retrieved from litter.
1.3 x 0.9mm

Punctid new sp 5. 1.3 x 0.9mm

Punctid new sp 29. Relatively common, white shell fine sculpture. Found from North cape to North West Nelson.
1.0 x 0.9mm

Punctid new sp cf 6. 0.8 x 0.5mm

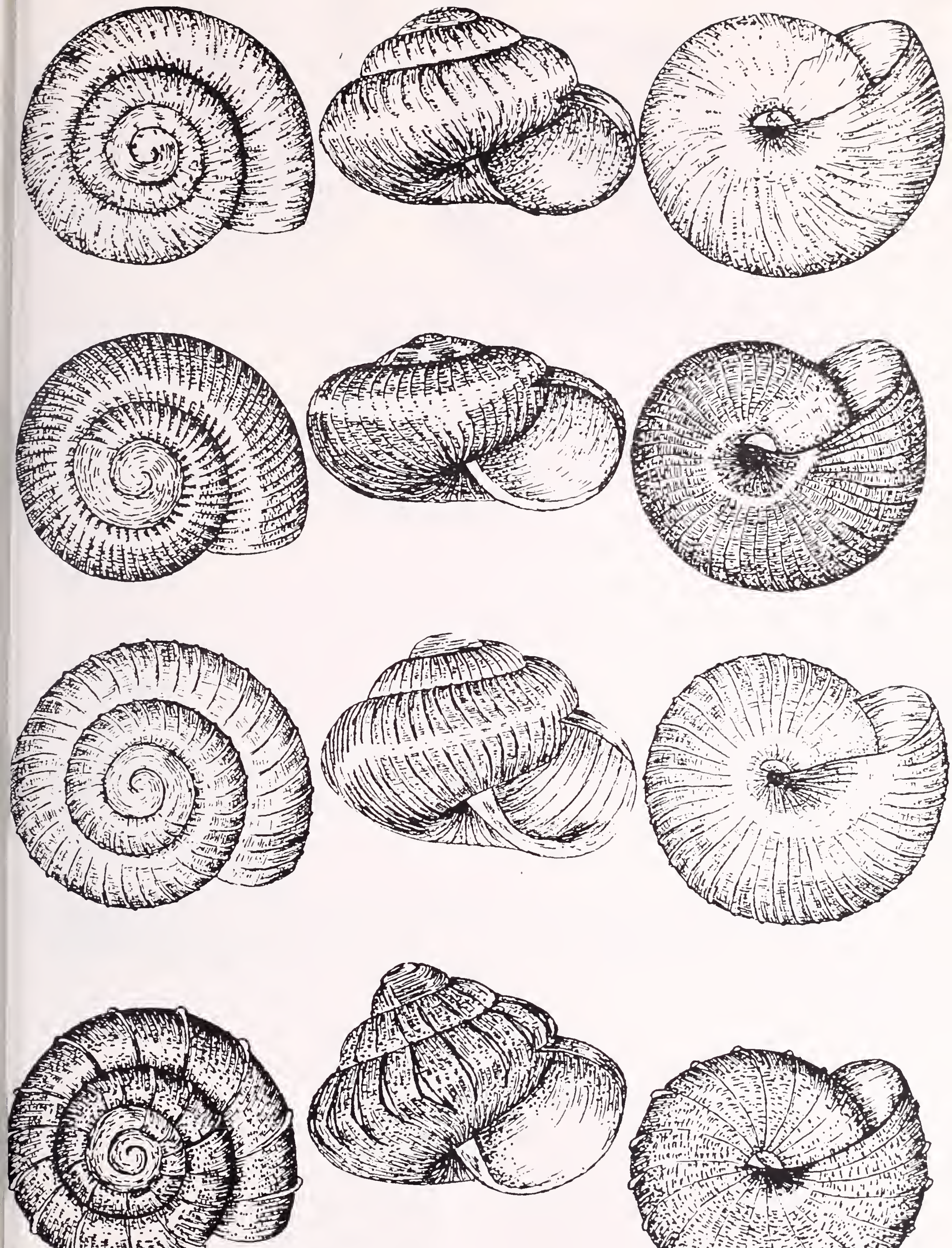


Punctid new sp 43. A nicely distinctive shell with interstitial sculpture, not very common anywhere.
1.3 x 0.9mm

Punctid miserabilis (Iredale -) Nicely sculptured white shell. Not uncommon. 0.9 x 0.6mm

Punctid new sp 8. Another small shell with distinct profile, closed umbilicus. 1.0 x 0.8mm

Punctid new sp 69. More conical in appearance. 1.3 x 1.1mm



Punctid new sp 61. (non regularis Pfeiffer 1855) an unmistakable shell in this area, with bristles and paddles. base very flat. 2.9 x 2.8mm

Punctid new sp 30. Sculpture regressed. 1.4 x 0.9mm

Punctid new sp 44. An elegant small shell with flattened base. Collected live on a twig. Blades much reduced when dry. 1.2 x 1.0mm

SUMMARY: I was originally unaware that within the Park boudaries there was a limestone Bluff - Raetihi. This is large and has a remarkable snail fauna of 68 species, more than half of the Park total of 97. Conspicuous by its absence was Serpho kivi, this was unexpected, however the total number of species is very good as some areas in Tongariro are somewhat defficient in snails, particularly on the Eastern side. Landsnails do not mind low temperatures, excess moisture can be a problem, but sand storms are another matter. Having seen the incredible dust storms that blow fine scoria to great heights in the East it is not so surprising they are absent. Tussock can not maintain suitable humidity levels, other vegetation is sparse and undersides of rocks produced no results. Habitats with trees are the only safe haven. On the Western side five species were collected at Whakapapiti at 1560m. Quite large stones settled into the ground had a fine new Allodiscus present. I would have considered Flamulina feredayi a bark or tree dweller but here it was associated with Celmisia debris. Twenty five species of Punctid collected covered a nice range, some particularly beautiful specimens.

I will continue sampling for a further period, as recent work has shown that snail populations vary from month to month. Prolonged spells of rain or longer than usual drought conditons restrict the number of species present.

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Abstract. Thirty-nine macrofossil taxa are recorded from the late Oligocene (Duntroonian to mid Waitakian) Torehina Formation at Waitete Bay, northern Coromandel Peninsula. A rich fauna dominated by infaunal suspension-feeding bivalves occurs in 25-30 m of calcareous siltstone and fine sandstone in the middle of the formation. Also recorded from this unit are 42 species of foraminiferal microfossils (3-5% planktic forms) from three faunal samples. Both macro and microfossils indicate accumulation in a sheltered marine environment at deep inner shelf depths (20-50 m).

A low diversity macrofauna, containing a mixture of soft sediment and hard substrate dwelling forms, occurs in sandy flaggy limestone in the upper part of the Torehina Formation. This fauna is also inferred to have lived at deep inner shelf depths on a sandy seabed where patches of lithified bioclastic sandstone was developing.

These fossil-based paleoenvironmental assessments indicate that the Torehina Formation was deposited during an interval in which sea level was raised or the area subsided 80-90 m.

Rec. Auckland Inst. Mus. 30: 13-26 1993

DESCRIPTIONS AND REDESCRIPTIONS OF LANDSNAILS (MOLLUSCA: PUNCTIDAE) IN THE GENERA *PHRIXGNATHUS* AND *TAGUAHELIX*

F.M. CLIMO* AND J.F. GOULSTONE**

* MUSEUM OF NEW ZEALAND
** AUCKLAND

Abstract. Types of *Phrixgnathus francesci* Webster, 1904 and *Phrixgnathus elaiodes* Webster, 1904 contain more than one species in each case and lectotypes are here selected in line with the author's original description. Both species are transferred to the genus *Taguahelix* Powell, 1955. Two new species, *Phrixgnathus douglasi* and *Taguahelix crispata*, are described. These snails have been confused in the past with the Webster species. *Phrixgnathus brunneus* is also described, a species which A.E. Brookes intended naming about 1930, having selected prospective types from the Bay of Plenty.

Rec. Auckland Inst. Mus. 30: 27-45 1993

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